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Medicaid Drug Use Review Demonstration Projects



Report to Congress
1995



U.S. Department of Health and Human Services
Health Care Financing Administration
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**MEDICAID DUR DEMONSTRATION EVALUATION
SECOND REPORT TO CONGRESS
EXECUTIVE SUMMARY**

1.0 INTRODUCTION

Section 1927(g) of the Social Security Act, as added by 4401(a)(3) of the Omnibus Budget Reconciliation Act of 1990 (OBRA 1990), requires that all State Medicaid programs implement both retrospective and prospective drug use review and pharmacist counseling programs. OBRA also calls for demonstrations of a system of on-line prospective drug use review (OPDUR) and reimbursement of pharmacists' cognitive services (CS). The Health Care Financing Administration (HCFA) awarded demonstration grants to Iowa and Washington. In March, 1994, HCFA submitted an initial Report to Congress on the status of these demonstrations. This second Report to Congress provides an update on the demonstrations and a review of baseline data from the two demonstration States.

Medicaid is currently the nation's largest payer for retail prescription drugs. In the past few years, Medicaid and other third party payers have begun to take steps to protect patients from inappropriate prescribing practices. Drug use review (DUR) represents one such step. Pharmacists initiate prospective DUR, reviewing prescriptions at the point of sale for potential problems and intervening with prescribers, other pharmacists or recipients as appropriate. State boards or agencies initiate retrospective DUR, reviewing profiles of prescribers, pharmacists or recipients to detect patterns of inappropriate prescribing, dispensing or utilization. So far, no well-controlled studies of the effectiveness of DUR have been conducted. The Iowa demonstration tests an on-line system of conducting prospective DUR.

Pharmacists are paid to dispense prescription drugs but not to provide CS, which include reviewing the appropriateness of prescriptions, negotiating with prescribers on potential changes in prescriptions, and educating patients. Some have argued that the rate of inappropriate prescribing will be reduced if pharmacists are paid to provide CS. The Washington demonstration tests the effects of paying for CS.

2.0 THE MEDICAID DUR DEMONSTRATIONS

Iowa and Washington were awarded demonstration grants in October 1992. The Federal Government granted waivers for the demonstrations in December 1993. Iowa implemented its OPDUR program in June 1994. Washington began paying for CS in February 1994.

Iowa OPDUR Program

Iowa's demonstration was implemented by the Iowa Department of Human Resources, working with researchers from the University of Iowa, Drake University, and the Iowa Pharmacists Association, as well as the National Data Corporation (the OPDUR software

vendor) and Unisys, the State's Medicaid vendor.

Iowa researchers clustered 223 pharmacies in 49 counties according to shared prescribers. The clusters were randomly assigned to treatment or control status. Both groups transmit claims electronically to a central data base for screening, but only treatment pharmacies receive OPDUR electronic messages concerning potential prescribing problems. Four types of screens (dosage, overuse/early refill, drug-drug therapeutic duplication, and drug-drug interaction) are being applied to eight drug categories: angiotensin converting enzyme (ACE) inhibitors, calcium channel blockers, digoxin, histamine H²-receptor antagonists, nonsteroidal anti-inflammatory drugs, anti-depressants, anti-psychotics, and benzodiazepines. Iowa will also collect information on the CS provided in both treatment and control pharmacies.

By December 1994, Iowa had recruited 223 participating pharmacies. Initial problems were encountered in some of the OPDUR screens. Iowa researchers have worked with NDC to test for and rectify these problems.

Washington Payment for CS Program

Washington's demonstration was implemented by the Washington Department of Social and Human Services, working in cooperation with the University of Washington School of Pharmacy.

Washington planned to recruit pharmacies into three groups. Group A would receive payment for providing CS (at \$4 per encounter of 6 minutes or less, and \$6 per encounter over 6 minutes) and a flat monthly payment for participating in the demonstration. Group B would receive only the participation payment. Group C would be the comparison group, receiving no payments through the demonstration. In addition to payment, Groups A and B pharmacies would be required to submit documentation of CS to researchers at the University of Washington.

Washington also selected pharmacies from clusters, achieving its target of recruiting 200 pharmacies over several months, beginning in spring 1994. These pharmacies were assigned to Groups A and B. Group C pharmacies have not yet been selected.

Initially, Washington encountered problems in the completeness and quality of CS documentation submitted by participating pharmacies. Some of these difficulties appear to have been caused by pharmacists' unfamiliarity with computer software provided for CS documentation. Washington researchers planned additional training to correct pharmacists' problems in using documentation software.

3.0 DESIGN OF THE EVALUATION

HCFA awarded Abt Associates a contract to evaluate the demonstrations, using data

from the demonstrations and other sources to answer two questions:

1. Did the DUR enhancements tested in the demonstrations achieve net improvements in prescribing practices, reductions in health care utilization and expenditures associated with prescription problems, and reductions in preventable adverse health outcomes, when compared to OBRA-mandated DUR systems?
2. Are these enhancements likely to be cost-effective for the State Medicaid programs and for the Federal Government?

The evaluator will implement a research plan to address these questions by comparing treatment and control pharmacies, and Medicaid recipients and prescribers linked to these pharmacies, from the period before the demonstrations through the period when the demonstrations are in operation. In addition, comparisons will be made between OPDUR and non-OPDUR pharmacies, recipients and prescribers in Iowa and other States, including a "co-experimental State" that has also implemented OPDUR (Maryland) and a "comparison State" that has not implemented OPDUR (Georgia).

The evaluation will focus the research on those drug categories that are included in Iowa's OPDUR screens, and will target specific groups of recipients selected because they are expected to be at relatively high risk of experiencing prescription problems: the ambulatory (non-institutionalized) elderly, adult (non-elderly) multiple drug users with three or more prescriptions per month, and adult (non-elderly) diabetics.

Several analyses are planned. First, the evaluator will use a screening system developed for this purpose to assess the frequency of *prescription drug problems* before and after the demonstrations are implemented. Second, trends in selected *clinical outcomes* will be analyzed, and case-control studies will be conducted to estimate the effectiveness of CS interventions in preventing adverse clinical outcomes. Trends from the baseline through the demonstration period in *health services expenditures and utilization* will be analyzed, to capture effects of the demonstrations on both prescription drug and other Medicaid (and Medicare) expenditures and utilization. The effects of the demonstrations on *access to Medicaid-reimbursed prescription services* will be analyzed with Medicaid claims and provider data. Finally, *process analyses* will address the questions of how DUR screens and CS contribute to measured effects of the demonstration. The evaluator will attempt to analyze the effectiveness of *retrospective DUR*. Finally, the evaluation will simulate the *cost-savings and cost-effectiveness* of DUR for the Medicaid program.

Data for these evaluation activities will come from State Medicaid Management and Information System claims, enrollment, and provider data; Medicare claims and eligibility data from the National Claims History files; demonstration DUR and CS data; a survey of pharmacies and pharmacists in the two demonstrations, and in samples of pharmacies selected in the co-experimental and comparison States; focus groups of prescribers and pharmacists; and

information collected in site visits in the demonstration, co-experimental, and comparison States.

4.0 IOWA AND WASHINGTON BASELINE CHARACTERISTICS

To interpret trends in key evaluation measures, it is important to understand changes in Medicaid policies, expenditures, and utilization that occurred during the baseline pre-demonstration period for the evaluation (1989 through 1993).

Policy Changes

Iowa Medicaid broadened prescriptive authority to non-physicians in 1991. In addition, Iowa extended coverage for rehabilitative services, hospice care, and nursing facility services to certain groups of Medicaid recipients, and expanded coverage to low income pregnant women and children; by 1990, income qualifying limits had been raised to 185 percent of the Federal Poverty Level (FPL). Iowa also began to implement an expansion of managed care coverage for Medicaid recipients, largely targeted to individuals qualified through the Aid for Families with Dependent Children (AFDC) program. None of Iowa's initial managed care contracts covered prescription drugs.

Washington Medicaid made several changes related to prescription drugs, including an increase in the maximum allowable charge for several drugs, a \$1.00 copayment for prescription drugs, and, in 1993, a mandatory prescription drug discount program (the Washington State Supplemental Discount Program). Washington also expanded coverage for pregnant women and children, implementing a qualifying income limit of 185 percent of the FPL one year earlier than Iowa (in 1989). Coverage of personal and hospice care was extended to the categorically-eligible in 1990, and payment reforms, including a physician co-payment, were implemented as well. Washington implemented the "Healthy Options Program", with mandatory managed care enrollment in most areas of the State for AFDC recipients; 2 of the 11 managed care plans cover prescription drugs.

Changes in Expenditures and Utilization

Iowa

In Iowa, total Medicaid expenditure grew by 62 percent during the baseline period, from \$541 to \$877 million an increase of roughly 62 percent.

About one-half of Iowa Medicaid enrollees were children, but children incurred only one-quarter of all expenditures. Over one-half of Medicaid expenditures were incurred by the elderly and adult disabled. Over the baseline period, the percent of Medicaid enrollees who were elderly declined slightly, from 15.3 to 13.6 percent, but disabled adults increased slightly, from 10.2 to 10.4 percent. Both of these groups continued to incur about 60 percent of total Medicaid expenditures throughout the period.

Elderly Iowa Medicaid recipients accounted for about half of all Medicaid expenditure on the eight drug categories upon which this evaluation will focus, followed by disabled adults with over 30 percent. Over the baseline period, Medicaid payments for these eight drug categories increased by 50 percent in the pharmacies participating in the demonstration. Payments per user of these drugs increased by about one percent. Over the same period, the share in total drug payments of these eight drug categories declined slightly in the demonstration pharmacies, from 31.0 to 26.1 percent. Of these drugs, the share of calcium channel blockers, antidepressants, and ACE inhibitors increased, while expenditures for NSAIDs, benzodiazepines and antipsychotics decreased. Expenditures for H² receptor antagonists and digoxin remained relatively constant.

Washington

Between 1989 and 1993, total Medicaid expenditures in Washington grew from \$827 million to \$1.6 billion, an increase of roughly 96 percent.

Payment for professional services increased in share of the total, from 26.1 to 33.6 percent. Prescription drug payments also increased in share, from 8.1 to 10.2.

In Washington, non-disabled adults increased their share of Medicaid payments, from 24.0 to 32.7 percent; children's share increased as well, from 19.0 to 23.6 percent. Disabled adults and the elderly incurred over one-half of total expenditures, as in Iowa, but their share declined during the baseline period.

Medicaid payments for the eight drug categories of the evaluation increased by nearly 300 percent in the demonstration pharmacies from 1989 to 1993. Payments per user increased over the same period by more than 45 percent. Prescriptions per user increased slightly, from 5.1 to 5.4 per year. In the demonstration pharmacies, the eight evaluation drug categories constituted a declining share of all Medicaid drug payments, (from 29.9 to 27.8 percent). Of these drugs, the share of calcium channel blockers, antidepressants, H² receptor antagonists, and ACE inhibitors increased, while expenditures for NSAIDs, benzodiazepines and antipsychotics decreased. Expenditures for digoxin remained relatively constant.

Conclusion

During the baseline period, with the exception of Washington's mandatory supplemental drug rebate program and the expansion of managed care in both Iowa and Washington's Medicaid populations, there were few important changes in Medicaid policy. The supplemental rebate program may influence pharmacists' behavior and will have to be included as a potential influence on outcomes of the Washington demonstration. The timing and coverage of managed care programs in Iowa and Washington Medicaid will also have to be addressed because they may affect the availability of data and utilization of health services by Medicaid recipients.

In the context of rapidly increasing Medicaid expenditures and recipient coverage,

prescription drugs claimed a larger share of the total in both States. Expenditures for the eight drug categories covered in this evaluation declined, as a share of total Medicaid drug expenditures, reflecting in part decreases in the elderly and disabled adults' share of Medicaid expenditures in both States. These trends do not threaten the evaluation, but they do suggest that these States, and perhaps others planning to implement DUR screening programs, should review the categories of drugs and screens that should be included in DUR programs, in order to more effectively address potential prescription problems among rapidly increasing recipient groups.

5.0 PLANS FOR DATA COLLECTION AND ANALYSIS

HCFA's evaluation of the Medicaid DUR demonstrations will end in March 1998. The operational phases of the demonstrations differ in length between Iowa and Washington. Washington will operate for 18 months, from February 1994. Iowa will operate for 3 years, from June 1994.

Three primary data collection tasks are planned: a survey of pharmacies and pharmacists in Iowa (in spring 1996) and in Washington (spring, 1995). Also during the spring of 1996, 100 pharmacies in Maryland and Georgia will be surveyed.

Two rounds of site visits will be conducted, one in the fall of 1995 and one in the spring of 1997. In addition to interviews of key officials, project staff will conduct focus groups with prescribers and pharmacists during these site visits, to gain insights into perceptions of the two demonstration interventions and other State Medicaid DUR policies and programs, as well as suggestions for alternative approaches to controlling misprescription.

In each year of the evaluation, the evaluator will review annual State Medicaid DUR reports, to describe national changes and developments in Medicaid DUR, particularly with respect to implementation of OPDUR programs.

Medicaid and Medicare data, together with demonstration data provided by Iowa and Washington, will be used to construct analysis files. Statistical analyses of the Medicaid DUR secondary data base will be conducted each year of the evaluation.

Annual Reports on the evaluation will be submitted to HCFA in 1995, 1996 and 1997. The Final Report will be submitted in March 1998.

1.0 INTRODUCTION

Section 1927(g) of the Social Security Act, as added by 4401(a)(3) of the Omnibus Budget Reconciliation Act of 1990 (OBRA 1990), requires that all State Medicaid programs implement both retrospective and prospective drug use review and pharmacist counseling programs. Section 4401(c) of OBRA 1990 also calls for demonstrations to test the effectiveness of two specific interventions relative to prescription drugs: 1) implementation of a system of on-line prospective drug use review (OPDUR) in at least 10 States and 2) reimbursement of pharmacists' cognitive services (CS) in no fewer than 5 States.

The Health Care Financing Administration (HCFA) sent requests for proposals to all 50 States. Only 5 States responded to the solicitation. An expert panel recommended that HCFA fund the Iowa and Washington demonstration projects. In March 1994, HCFA submitted an initial report to Congress on the status of these demonstrations. This second report to Congress provides an update on the demonstrations and a review of baseline data from these two demonstration States.

1.1 Medicaid Coverage of Prescription Drugs

Medicaid is currently the nation's largest payer for retail prescription drugs (\$6.8 billion in FY 1992) (USDHHS, 1994). Over time, third parties have increased their share of pharmacy payments, from around 12 percent in 1969 to nearly 57 percent in 1989 (Schondelmeyer and Thomas, 1990). In 1989, Medicaid accounted for about one-half of all third party payments for prescription drugs (Siegelman and Feierman, 1990). Historically, Medicaid payments have contributed more to independent than to chain pharmacies' revenues, though recently Medicaid payments have grown more rapidly among the chains. Although an optional service under Title XIX, all State Medicaid programs presently cover prescription drugs. States pay pharmacies on a retrospective fee-for-service basis, at the lower of the pharmacy's usual and customary charge or on a cost basis (the estimated acquisition cost of the drug plus a fixed dispensing fee). For Medicaid recipients enrolled in prepaid managed care plans, States pay a capitated rate for services. However, prescription drugs might not be included within the capitated service package.

As payments for prescription drugs increased at annual rates of 10 to 20 percent over the past decade, Federal and State officials took steps to contain outlays. States have developed an assortment of payment systems by imposing copayments, requiring prior authorization for some medications, setting different dispensing fees, capping refills, prescription quantities, and the number of prescriptions that can be filled or refilled within a given time period. As part of OBRA 1990, Congress required pharmaceutical manufacturers to conclude rebate agreements with the Federal Government (based on price discounts made available to other buyers), and to provide these rebates to State Medicaid programs.

In the last few years Medicaid and other third party payers have also begun to take steps to protect patients from inappropriate prescribing practices. Ray, Griffin, and Schorr (1990) report a conservative estimate that medical toxicities are responsible for between 3 and 5 percent of all hospital admissions from the general population. Recipients' non-compliance with directions for drug administration account for some of these hospitalizations. However, most payers have developed programs to identify physician prescribing errors, detecting incorrect prescription dosages or drug-drug interactions, failure to adjust for potential allergic reactions to drugs, and pharmacists' dispensing errors.

1.2 Drug Use Review (DUR)

In response to concerns about cost and quality of prescribing, public and private payers have implemented drug use review (DUR) programs. Historically, State Medicaid agencies conducted prescription drug surveillance to deter fraud and abuse, even though an early Department of Health Education and Welfare (DHEW) task force described DUR as a dynamic process "aimed first at rational prescribing and consequent improvement in quality of care and second, at minimizing needless expenditures" (DHEW, 1969). DUR constitutes a review of steps in the drug therapy process using explicit predetermined criteria or measures of quality and appropriateness. Reviewers use these criteria to identify potential problems, based on available information. With all the evidence in hand, an intervention may be made to correct identified problems.

OBRA 1990 required that all State Medicaid programs implement both prospective and retrospective drug use review (PDUR and RDUR). Pharmacists initiate PDUR, reviewing

prescriptions at the point of sale for potential problems and intervening with prescribers, other pharmacists, or recipients as appropriate. State DUR boards or agencies initiate RDUR, reviewing profiles of prescribers, pharmacists or recipients to detect patterns of inappropriate prescribing, dispensing or utilization. The profiles are created from paid drug claims data that are screened for exceptions using predetermined standards. These agencies may then intervene directly with subjects of this profiling to present findings and suggest corrections.

Although the assumption that DUR can prevent some prescription drug problems and avert some adverse health outcomes is plausible, as Jay, et al. 1991 note "...no well-controlled evaluation of DUR systems, prospective or retrospective, has been performed." Little is known about the prevalence of drug therapy problems or about the frequency of hospital admissions due to preventable drug problems. Jay and his colleagues at the Stanford Research Institute (SRI) conducted the most ambitious study of DUR yet attempted, an evaluation of the retrospective Therapeutic DUR (T-DUR) system of California's Medi-Cal program. The investigators contrasted counties where RDUR interventions had been implemented with counties with no interventions, finding no effects of RDUR on total or prescription drug costs. In a critique of the SRI study, Lipton and Bird (1993) point out that the researchers used all prescriptions and recipients to test for RDUR effects, rather than the specific medications and recipients targeted by the RDUR interventions.

1.3 Cognitive Services

Third parties pay pharmacists to dispense prescription drugs. However, the time and effort needed to dispense varies depending on how pharmacists view their professional responsibilities to prescribers, patients, and other pharmacists. A pharmacist who judges a prescription to be inappropriate or life-threatening may have consulted colleagues, compendia, or computer software to arrive at this decision. Followup on this judgment may require one or more contacts with the prescriber. If the prescriber cancels or changes the prescription, the pharmacist will probably have to counsel the patient on the reasons for and consequences of the change. This activity, related to dispensing but casting the pharmacist in the role of negotiator (with prescribers) and educator (with patients) exemplifies the diverse CS that pharmacists provide on a daily basis. In this example it is clear that prospective drug use review, undertaken

by the pharmacist, is a CS designed to ascertain the presence or absence of a prescription problem. On-line prospective DUR is an informational tool pharmacists may use, together with their own expertise and other secondary sources, to arrive at this conclusion. Interventions with prescribers and patients to correct problems are also CS.¹

Both DUR demonstration interventions are designed to affect the quantity and quality of CS related to prescription problems. Iowa's OPDUR system alerts participating pharmacists to potential problems by screening prescriptions against drug-specific criteria. Washington pays pharmacists for CS that involve gathering information and intervening to change prescriptions.

For the most part, OBRA 1990 encourages States to develop computer screening programs that support CS without paying for them. Many States other than Iowa have implemented or have plans to implement OPDUR systems. However, Washington's CS payment demonstration is unique. No other State Medicaid program has plans to replicate this approach.

Conclusive evidence that CS produce the desired outcomes (in prevented misprescription and adverse health outcomes) is lacking; Lipton and Bird (1993) note that most research purporting to show effects on ambulatory and inpatient utilization of pharmacists' interventions with prescribers and patients suffers from design flaws (no control groups, and inferences drawn from relatively small samples). Lipton and Bird's own controlled trial showed that pharmacists achieved desired changes in patient compliance and prescriber practice, but no detectable effects on patient outcomes. The authors surmise that the true effects of pharmacists' interventions are too small to be detected by any but the largest studies. HCFA expects that data from the Medicaid DUR demonstrations should support reasonably precise estimates of the size of these effects.

¹ Christensen et al. (1993) identify certain "routine cognitive functions" that should not require separate payment, since they are assumed to be covered by state Medicaid dispensing fees (for example, clarifying incomplete or illegible prescriptions, not dispensing when the pharmacist identifies "obvious" errors, communicating drug use instructions to patients). However they identify two additional classes of cognitive services in pharmaceutical care that they term "value-added pharmaceutical services" (VAPS). VAPS related to dispensing include prospective drug use review and consultations with prescribers, patients, and other providers; these are the cognitive services for which participating pharmacists may receive payment in Washington. VAPS not related to dispensing include academic detailing, in-service training for health professionals and other educational functions not addressed by these demonstrations.

1.4 Overview of the Report

Because both States implemented their demonstrations in 1994, data are not yet available to evaluate the effects of OPDUR or payment for CS. This report will describe the current status of the demonstrations and the evaluation, and will present certain baseline characteristics of the demonstration States.

Chapter 2 provides brief descriptions of the Iowa and Washington demonstrations, concentrating on developments since HCFA's previous report to Congress in March 1994. Chapter 3 presents a summary of the evaluation design.

Chapter 4 presents baseline data for Iowa and Washington. This chapter covers pertinent Medicaid program characteristics in both States, including statistics describing enrollments by eligibility category and Medicaid-reimbursed prescription drug and other utilization. Chapter 4 also includes preliminary data from Washington's CS claims payment system.

Chapter 5 describes evaluation plans for data collection, analysis, and report production.

2.0 THE MEDICAID DUR DEMONSTRATIONS

OBRA 1990 mandated two Medicaid demonstration designs related to drug therapy interventions by pharmacists. One would test the effects of paying for pharmacists' cognitive services (CS). The other would test the effects of giving pharmacists access to a central data base with drug appropriateness screens to facilitate on-line prospective drug use review (OPDUR). Originally, the Federal Government expected that several State Medicaid programs might implement, separately and or in combination, demonstration models of both CS and OPDUR. After soliciting and reviewing applications for cooperative agreements, HCFA awarded demonstration grants to two State Medicaid agencies for a CS payment demonstration in Washington and an OPDUR demonstration in Iowa. This chapter describes the current status of the demonstrations in Iowa and Washington.

Section 2.1 reviews the goals and objectives of the demonstrations, followed by Section 2.2 which presents the current status of both the Iowa and Washington demonstration projects.

2.1 Goals and Objectives of the Demonstrations

The Iowa and Washington demonstrations, together with two additional States selected for comparison with the Iowa model, will provide the data to test the relative effectiveness of two relatively unproven models of drug therapy intervention. Demonstration data will support separate evaluations conducted internally by universities in the two demonstration States, as well as a cross-cutting evaluation conducted by Abt Associates under contract to HCFA. Together, these evaluations will assess the effects of both interventions on the frequency of prescription drug problems, the volume and costs to Medicaid of prescription drugs and other covered health services, access to prescribers' services, and the behavior of pharmacists, prescribers, and recipients in the process of prescribing and dispensing drugs. The sum total of these analyses will, in turn, produce the raw materials needed to support an assessment of the cost-savings (to the State and Federal Governments) and cost-effectiveness of CS and OPDUR programs.¹

¹ HCFA's evaluator will also collect data for tests of the effectiveness of retrospective drug use review (RDUR) programs in the two demonstration states and the two comparison states. RDUR, though not part of the demonstrations, represents an alternative drug therapy intervention that OBRA 1990 mandates for all state Medicaid programs. A state DUR board carries out

2.2 Demonstration Designs and Initial Operating Experience

Iowa and Washington were awarded demonstration grants in October 1992. The Federal Government granted waivers for the demonstrations in December 1993. Iowa implemented its OPDUR program in June 1994. Washington began paying for CS in February 1994.

2.2.1 Iowa: On-Line Prospective Drug Utilization Review (OPDUR)

HCFA signed a cooperative agreement for the OPDUR demonstration with the Iowa Department of Human Resources, in cooperation with researchers from the University of Iowa, Drake University, and the Iowa Pharmacists Association. In turn, Iowa selected the National Data Corporation (NDC) to serve as the vendor of the OPDUR software. The Medicaid fiscal intermediary, Unisys, serves as the host of the OPDUR software, providing at least two telecommunication switches for participating pharmacy access. Iowa implemented the OPDUR program in a first wave of 122 pharmacies in June 1994; a second wave of 104 pharmacies implemented the demonstration in December 1994 bringing to 223 the total number of participating pharmacies with dropouts.

As part of the pharmacy recruitment effort, the University of Iowa assessed the hardware and software capabilities of pharmacies in the State, including planned upgrades to computer systems, forms of telecommunications, as well as general interest in participation in the project. A pharmacy computer survey was mailed to all pharmacies in the State in the beginning of June 1993. In addition to identifying the computer requirements of pharmacies, recruitment efforts included publicizing the demonstration in quarterly newsletters and at regional and State pharmacist meetings.

Iowa grouped pharmacies recruited for the demonstration into clusters and randomly assigned the clusters to treatment and control status. Both treatment and control pharmacies are being reimbursed for the transmission of claims data via the point-of-sale (POS) system that

RDUR interventions, based on retrospective reviews of prescription drug profiles for prescribers, pharmacies, or patients. Prescribers identified as misprescribing above some acceptable rate during this review are usually the targets of RDUR interventions.

allows participants to submit prescription claims, receive adjudicated responses, and (if a treatment pharmacy) receive OPDUR messages electronically.

To implement the OPDUR screens, Iowa employs an "integration product" that adapts commercial software to local conditions. NDC tailored existing commercially available on-line prospective DUR software, known as the ProDUR system, to meet the objectives of the Iowa demonstration. While the ProDUR software includes a set of clinical modules that are composed of common problems (e.g., drug interactions, duplicate drug therapy, therapeutic overlap, age precautions, etc.), the threshold parameters and the specific drugs that are to be screened were determined by the demonstration project. In addition to three screening criteria specified in the UM/PCPS criteria (dosage, drug-drug therapeutic duplication, and drug-drug interaction), Iowa also screens for overuse/early refill of all drugs and may add other criteria at a later date, such as drug-disease precautions. The drug classes slated for initial screening include all of the UM/PCPS criterion sets: angiotensin converting enzyme (ACE) inhibitors, calcium channel blockers, digoxin, histamine H₂-receptor antagonists, nonsteroidal anti-inflammatory drugs, anti-depressants, anti-psychotics, and benzodiazepines. Iowa also employs an area coordinator to provide pharmacists day-to-day assistance with any problems with demonstration procedures.

Data describing both treatment and control pharmacists' CS are important to the evaluation of the Iowa demonstration (as they are in Washington) because change in pharmacists' CS behavior is a principal objective of the OPDUR program. Iowa designed a CS documentation system which is generally comparable to Washington's. Iowa has trained all participating pharmacists to document CS as a primary data collections mechanism. Codes have been designed to correspond with possible problem/intervention/outcomes, and a logical subset of the most frequent combinations was developed (3,000). Participating pharmacists document on carbonless duplicate forms CS provided to all Medicaid recipients, irrespective of whether OPDUR messages are received.

Since implementing the OPDUR demonstration, Iowa investigators have addressed two major issues.

Number of participating pharmacies. The Iowa demonstration fell short of its target for pharmacy recruitment, posing a potential threat to its ability to generate sufficient data to test OPDUR effects. Having targeted 200 pharmacies for participation, Iowa began a second wave

of recruiting to expand the number of participants from the Wave I sample of 122. Complicating this task was the need to add new pharmacies without disrupting the design that produced the Wave I pharmacy sample. Iowa worked with the evaluation contractor during the summer and fall of 1994 to design a method for re-clustering all Iowa pharmacies. At the same time, Iowa recruited 104 new pharmacies to participate in the demonstration. In November, Iowa adopted a re-clustering strategy that assured that no pharmacy assigned to the experimental group in Wave I would be a control pharmacy in the new sample (though Wave I control pharmacies might be re-assigned to experimental status). After randomization, Iowa added 47 experimental and 57 control pharmacies. With some attrition from the Wave I cohort of pharmacies, Iowa's demonstration included 223 in December 1994.

ProDUR screens. Early experience with the ProDUR system uncovered problems of logic in some of the screens. Since NDC planned to add an updated ProDUR version during the summer of 1994, the Iowa investigators proposed to run tests on the new system, both to assure that problems detected in these tests would be corrected in a timely fashion and to provide benchmark data on this generation of software against which to compare additional NDC updates over the course of the demonstration. Problems addressed as a result of these tests have not been in the "screens" themselves but in the integration product. Examples of problems encountered and corrected include: improper prioritization of data sources for recipient, date of birth, NDC/Unisys format incompatibilities which complicated assessment of "same" or "other" prescriber for drug-drug interactions and duplications and inaccurate recording of messages sent.

2.2.2 Washington: Payment for Cognitive Services

HCFA signed a cooperative agreement for the CS payment demonstration with the Washington Department of Social and Human Services (DSHS), in conjunction with the University of Washington School of Pharmacy. As in Iowa, Washington investigators devoted the first year of the project to design and development activities. Originally, payment for and documentation of pharmacist CS were to be in effect for only one year, followed by a one-year period of analysis and evaluation. With HCFA's approval, Washington recently extended the intervention by 6 months (through September 1995).

Eligibility for participation in the demonstration was based on several criteria. Community pharmacies throughout Washington that dispense at least 50 Medicaid prescriptions per month were invited to participate. Among the qualified pharmacies that volunteered, some 200 were to be selected. As a condition of participation in the demonstration, all pharmacies under consideration were required to sign an agreement with Medicaid that they would participate regardless of the amount of compensation they might receive and that they would attend mandatory training and periodic review sessions. Further, potential participants would be required to send documentation of their CS activities to the University of Washington at least once a month, either on paper or diskette in postage-paid envelopes provided by the University. As in Iowa, Washington employs area coordinators to provide technical assistance to participating pharmacies.

Washington investigators initially anticipated that a total of 300 pharmacies would participate in the study, with 100 pharmacies assigned to each of three groups. Pharmacies in Treatment Group A are paid to document (at a flat monthly rate) *and* to provide (at a fixed rate per service) CS. Pharmacies in Treatment Group B are paid only to document the provision of CS. Group C will constitute a comparison group of non-participating pharmacies and would receive no payments related to CS. All participating pharmacies continue to receive Medicaid's usual dispensing fees for prescriptions.

Group A pharmacies will receive cognitive service fees for identifying and resolving drug therapy problems, even if the outcome of an intervention is that no prescription is dispensed. Participating pharmacists will receive payment for changes in prescriptions (including not dispensing the prescription) and for an extended patient counseling activity for an identified problem (e.g., suboptimal dosage regimen).

Through Washington DSHS, the demonstration pays two fixed fees for a Group A pharmacist's intervention, based on the level of effort required. Pharmacists receive \$4.00 for a brief encounter of 6 minutes or less and \$6.00 for an extended encounter of more than 6 minutes. Payment requires evidence for specific and identifiable potential drug therapy problems resolved during the course of routine dispensing activities and followed by changes in drug therapy. The demonstration will also pay for patient counseling performed pursuant to an

identified problem. Pharmacists are limited to reimbursement for up to two documented cognitive service activities per patient per day.

Washington implemented a pharmacy sampling plan designed to minimize the potential for contamination bias due to cross-pharmacy prescribing patterns. Pharmacy selection followed a two-step process.

At the first step, the Washington investigators formed clusters of pharmacies. Using 1992 Medicaid prescription claims, pharmacies in the State were linked with their most frequent prescribers. Pharmacies were then aggregated into clusters based on patterns of prescriber-pharmacy association. Clusters were formed around an index pharmacy so that, to the extent possible, patients of prescribers in a cluster did not fill all their prescriptions with pharmacies outside the cluster.

At the second step, investigators randomly assigned these clusters to one of the two treatment groups, and then sampled pharmacies from each group with the objective of selecting 100 pharmacies per group. Clusters were randomly assigned to Group A or B within a particular geographic location. By the end of April, there were 107 pharmacies assigned to Group A and 84 pharmacies assigned to Group B.

In the months since the demonstration began, Washington investigators have addressed issues, some of which are similar to Iowa's while others are unique to this demonstration.

Number of participating pharmacies. Washington shared Iowa's disappointment with the results of its initial attempts to recruit pharmacies. As of May 1994, after two waves of recruiting, Washington had assigned a total of 187 pharmacies (102 to Treatment Group A and 85 to Treatment Group B), dropping to 186 through attrition by August. Washington investigators resolved to recruit toward a target of 200 Group A and B pharmacies. In a third effort, ending September 1994, Washington achieved its target by adding 14 new pharmacies. During October and November, the demonstration retrained (continuing pharmacies) and trained (new sites) in demonstration procedures at various locations across the State.

Group C pharmacies. During the summer, Washington investigators began to design a methodology for sampling 100 Group C comparison pharmacies. It had been hoped that numbers of pharmacies volunteering for the project would have been sufficiently large to produce a Group C from among those not randomized to Groups A or B. In fact, volunteers

initially fell short of investigators' target of 200 treatment pharmacies. Investigators agreed that Group C pharmacies should be selected from the same cluster design used to sample treatment pharmacies, with safeguards implemented to minimize the degree of association between Group A pharmacies, receiving the principal demonstration intervention, and Group C.

CS code logic. An important task in Washington was reviewing and redefining the scope of CS and eligibility for reimbursement, in light of experience during the early months of implementation. The original documentation scheme included 17 drug problem codes, 7 intervention activity codes, and 8 prescription outcome codes. Suspended records due to valid but seemingly "illogical" codes were encountered as the coded problem appeared to be inconsistent with result codes on CS documentation. Inconsistencies often appeared to be due to differences between how pharmacists defined the prescription problem when first encountered and after an intervention had been provided.

The University of Washington, in consultation with a panel of pharmacists, reassessed the initial list of CS developed by the demonstration, to determine whether the categories can be defined sufficiently for valid documentation and whether reimbursement should be included for additional categories. Following panel recommendations, Washington added approximately 45 combinations of codes that became eligible for payment.

CS documentation and claims. Washington encountered problems in the completeness and quality of CS documentation. In the early months, a few pharmacies accounted for most of the CS claims. Six of the 48 pharmacies that submitted CS claims accounted for some 80 percent of all claims. Through September of 1994, 38 treatment group pharmacies had submitted no CS documentation, while 36 had submitted documentation each month of the demonstration. Some pharmacies that had chosen a computerized system for documenting CS encountered problems in using the software appropriately. These problems ultimately led to delays and gaps in submission of CS documentation to the demonstration staff at the University of Washington. At the same time, the evaluation contractor encountered difficulties when attempting to test the feasibility of linking CS documentation with CS claims and claims for prescriptions that should have been affected by CS activity. Linkages of these data are important for analyses of how payments to pharmacists affect CS interventions and how these interventions, in turn, affect financial and clinical outcomes in the Medicaid population.

Some of these difficulties were caused by decisions made early in the demonstration to suppress the identity of individual recipients on the CS documentation. Others appear to have been related to delays and errors experienced in using the computer software to document and submit CS service records.

Washington investigators enlisted the assistance of Washington DSHS in encouraging pharmacies to submit both CS claims (to DSHS) and documentation (to the demonstration). In April, DSHS began to hold payment on CS claims from pharmacies that were delinquent in CS documentation until the 15th of the following month. A procedure was implemented wherein DSHS also took an active role in follow up with pharmacies to promote appropriate use of the CS documentation software. Washington investigators planned training exercises for the fall session and encouraged its area coordinators to assist pharmacies in correcting problems encountered in using the CS documentation software.

3.0 DESIGN OF THE EVALUATION

The Omnibus Budget Reconciliation Act of 1990 (OBRA 1990) requires that all State Medicaid programs implement both prospective and retrospective drug use review (PDUR and RDUR) and pharmacist counseling programs. Section 4401 (c) of OBRA 1990 also mandates demonstrations to test the effectiveness of two DUR interventions:

- 1) implementation of a system of on-line prospective drug use review (OPDUR) and
- 2) payment for pharmacists' cognitive services (CS).

HCFA awarded cooperative agreements to implement an OPDUR demonstration in Iowa and a CS demonstration in Washington.¹ HCFA also awarded Abt Associates a contract to evaluate the demonstrations.² This chapter summarizes HCFA's current approach to the evaluation.

3.1 Policy and Research Questions

HCFA's DUR evaluation will use data from the demonstrations and other sources to answer two broad questions:

1. Did the DUR enhancements tested in the demonstrations achieve net improvements in prescribing practices, reductions in health care utilization and expenditures associated with prescription problems, and reductions in preventable adverse health outcomes, when compared to OBRA-mandated DUR systems?
2. Are these enhancements likely to be cost-effective for the State Medicaid programs and for the Federal Government?

This evaluation will also assess the relative effectiveness of RDUR. Finally, the evaluation will track and assess the progress of OBRA 1990 DUR implementation in all States during the demonstration period.

¹ OBRA 1990 encouraged states to experiment with DUR; OPDUR was cited as a possible model. Draft regulations listed several conditions states would have to meet if they were to implement an OPDUR program. As a result, several states not involved in the demonstration have implemented, or are planning to implement, OPDUR programs. No states outside the demonstration plan to pay for pharmacists' cognitive services.

² The Abt Associates evaluation team includes Pennsylvania State University and JEN Associates.

3.2 Research Design

DUR is a preventive intervention. As such, its full impact depends on two linked effects. First, DUR must improve prescribing practices. Second, improvements in prescribing practices must produce improvements in clinical and other outcomes. The **cost-effectiveness** or **cost-savings** of DUR also depends on how expensive DUR is in achieving these effects, relative to other uses of public funds. This evaluation will attempt to determine if the OPDUR and CS payment enhancements to PDUR and RDUR have favorable effects on a range of behavioral and clinical measures.

Both Iowa and Washington have designed their demonstrations to facilitate evaluations of DUR effects. Iowa recruited 223 volunteer pharmacies from 49 demonstration counties. Pharmacies were grouped into clusters according to shared prescriber clusters and were then randomly assigned to either treatment or control status. Both treatment and control pharmacies transmit prescription claims through the POS system and complete paper documentation of CS for the Iowa demonstration; only treatment pharmacies receive electronic DUR message responses that identify potential problems.

As of September 1994, Washington enrolled 110 Group A and 90 Group B pharmacies. The demonstration pays Group A pharmacies at fixed rates for providing CS, plus a monthly payment for documenting all CS provided. Group B pharmacies are paid only to document CS. Washington will sample between 100 and 200 pharmacies for Group C, which neither receive CS payments nor provide CS documentation, and hence receive no documentation fee.

To achieve the objectives of the cross-cutting evaluation, HCFA's evaluator augmented the States' own demonstration designs. Exhibit 3.1 summarizes the evaluation designs for the analyses of OPDUR, CS payment, and RDUR. The following are key elements in the evaluation design:

1. **Four-way and other contrasts.** The evaluation will estimate demonstration effects through four-way contrasts of treatment and control groups before (during a baseline period from 1989 through 1993) and after program implementation, wherever possible. This design minimizes both cross-sectional and temporal biases in estimated effects. Analyses that make use

Exhibit 3.1

EVALUATION OF MEDICARE AND DRUG USE REVIEW DEMONSTRATION PROJECTS EVALUATION DESIGNS

ON-LINE PROSPECTIVE DRUG USE REVIEW (OPDUR)

Study Arms ¹	Baseline Period 1989 - 1993	1994	Demonstration Period 1995	1996
Iowa Treatment Maryland	No OPDUR		OPDUR	
Iowa Control Georgia	No OPDUR		No OPDUR	

PAYMENT FOR COGNITIVE SERVICES (C'S) DEMONSTRATION PERIOD

Study Arms ¹	Baseline Period 1989 - 1993	1994	Demonstration Period 1995	1996
Washington Group A	No Payment	Payment: Per Service & Documentation		No Payment
Washington Group B	No Payment	Payment: Documentation		No Payment
Washington Group C	No Payment	No Payment		No Payment

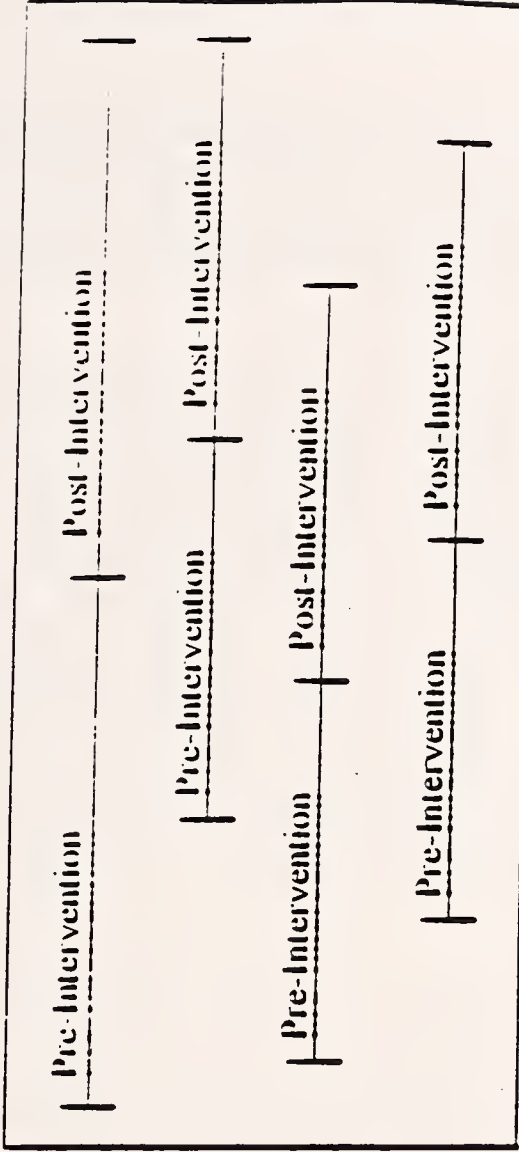
EXHIBIT 3.1 (CONTINUED)

RETROSPECTIVE DRUG USE REVIEW (RDUR)

Baseline Period
1989 - 1993

Post-OBRA 1190

Study Arms¹

Washington: Group C	No RDUR	RDUR/Onsite PDUR
Iowa		
Washington		
Co-Experimental State		
Comparison State		

¹Study arms are identified as pharmacies or pharmacy clusters, together with prescribers and recipients who do business with these pharmacies. Section 11 discusses threats to the evaluation design from potential contamination (through prescribers and recipients who use both treatment and control pharmacies).

of secondary Medicaid and Medicare administrative data will be used in the four-way design or, in some cases, pre/post contrasts. Analyses that depend partly on primary data that can only be collected during the demonstration will capture effects through cross-sectional comparisons of treatment and comparison groups.

2. **Separate State evaluation designs.** Data for the evaluation will come from within the two demonstration States and, for the Iowa demonstration, from two non-demonstration States. To achieve sufficient statistical power to detect small demonstration effects, Iowa treatment data will be augmented by data from a "co-experimental" State that has implemented an OPDUR system similar to Iowa's under OBRA 1990. The evaluator will also recruit a comparison State without a Medicaid OPDUR program in order to augment comparison data for the Iowa evaluation. Maryland has been selected as the co-experimental State, and Georgia will serve as the comparison State. All tests of CS payment effects will be conducted on Washington data. Since no other State pays for CS, and the gains in statistical power from adding comparison (non-CS) States are small, it was decided that a multi-State design similar to Iowa's would be impractical.
3. **Multiple units of analysis.** Although both States will target the demonstration interventions to pharmacies, the goal of DUR is to change prescriber behavior. Therefore, pharmacies and prescribers will be the appropriate units for some of the behavioral analyses. Analyses will also estimate demonstration effects on utilization and clinical outcomes among Medicaid recipients.
4. **Adjustments for different sampling methods.** Because neither State tried to maintain strict geographic separation of treatment and control pharmacies, the status within the demonstration of those prescribers and recipients who may use different pharmacies, some treatment and some control, may be unclear. In the analyses of demonstration effects, the evaluator will take steps to control for possible contamination among study arms produced by cross-pharmacy associations.³
5. **Selection of drug categories.** This evaluation will assess expenditures, utilization, outcomes, and pharmacy/prescriber behavior with respect to the prescription drugs included in the DUR screening criteria developed by the University of Maryland and the Philadelphia College of Pharmacy and Science (UM/PCPS), updated for the evaluation by investigators at the Pennsylvania State University. The Iowa demonstration is implementing an OPDUR system based

³ This problem will not arise in the co-experimental State, where all prescribers and recipients will be associated with OPDUR pharmacies, and in the comparison State, where OPDUR will not have been implemented.

on the UM/PCPS criteria. In this evaluation, the drugs included in the UM/PCPS criteria are referred to as "Screener Drugs".⁴

6. **Selection of recipient subgroups.** Some analyses will focus on subgroups of the Medicaid recipient population, selected to minimize variance in demographic and medical factors that might confound estimates of DUR effects.

Ambulatory elderly (age 65+) will be identified by the absence of any nursing home claims within a specified time period. As a group, the elderly use prescription drugs more frequently than most other Medicaid recipients. In addition, prospective drug use review under OBRA (and the two demonstration interventions) does not apply to institutionalized recipients.

Adult multiple drug users (age 20-64) include recipients who are not elderly but who use three or more prescription drugs per month. Since many elderly are multiple users by this definition, a subgroup of elderly with a higher threshold will be identified for the analysis. Prescription problems are expected to be relatively more frequent among multiple drug users.

Adult diabetics (age 20-64) will be identified by the presence of one or more Medicaid claims for insulin or oral hypoglycemics in a specified time period. Diabetics are subject to high levels of morbidity, and therefore a group with potentially high risk for prescription drug problems. In addition, this group often receives prescription drugs in the classes being screened in Iowa.

In addition, the evaluation will analyze the effects of the programs on clinical outcomes within sub-populations of recipients, defined by the use of particular Screener Drugs and by common medical indications for these drugs (based on evidence from claims).

7. **Medicaid eligibility status.** Recipient-level analyses will include only individuals who were continuously eligible *after* some analytically-relevant event (such as a screen failure or the date on which the demonstration was implemented) for an appropriate time period *and continuously eligible for one year before* this event.

⁴ Prescription drug categories included in the PSU screener are: ACE inhibitors, calcium channel blockers, digoxin, histamine H(2)-receptor antagonists, non-steroidal anti-inflammatory drugs (NSAIDS), antidepressant drugs, antipsychotic drugs, and benzodiazepines. Screens for prescription problems in these categories include: dosage, drug-drug interactions, duration of drug therapy and duplicative therapy.

Depending on the analysis, the post-event time period may be one quarter or several quarters. The long pre-event period is needed to capture measures of medical risk, based on patterns of prior utilization. To test for significant differences in age, gender, race and other factors that might suggest bias due to this exclusion rule, continuously-enrolled recipients within broad Medicaid eligibility categories will be compared to recipients with intermittent enrollment.

8. **RDUR effects.** HCFA also plans to evaluate the relative effectiveness of RDUR, a task complicated by the OBRA requirement that Medicaid programs must implement both RDUR and PDUR, so that a "pure" RDUR effect may be impossible to detect.⁵ The Medicaid DUR evaluation will compare prescriber behavior among prescribers not linked to OPDUR or CS payment pharmacies, before and after OBRA 1990 implementation, to test for the joint effects of RDUR, prospective DUR, and recipient counseling requirements of that law. In addition, subject to the availability of appropriate data, the evaluation will seek out testing opportunities during the demonstration by identifying RDUR interventions, the target prescriber populations, and populations of similar prescribers not exposed to interventions.
9. **The PSU Screener.** The UM/PCPS screening criteria described earlier will be incorporated in a computerized system. This system will be used to screen Medicaid claims for prescription drugs that fall within the eight Screener Drug categories, to determine whether or not one of several potential problems exist (incorrect dose, drug-drug interactions, among others). This system is referred to as the "PSU screener."

3.3 Data and Analyses

To assess the effectiveness of DUR, the evaluation will analyze secondary data (from the demonstration programs and from Medicaid and Medicare claims and eligibility files) and primary data collected in site visits, focus groups with prescribers and pharmacists, surveys of pharmacies and pharmacists, and analyses of State Medicaid annual DUR reports. Exhibit 3.2 summarizes analytic tasks, together with principal demonstration outcome measures, units of analyses, analysis methodologies, and data sources.

⁵ The same might be said for PDUR. However, because RDUR generally involves interventions on a subset of a state's prescribers (or pharmacies), it should be possible to test for PDUR effects (OPDUR or payment for CS). If the targets and timing of RDUR interventions are known, it should be possible to treat RDUR interventions as potential confounding influences on estimates of PDUR effects and to control for them statistically.

Prescription drug problems. DUR should reduce the frequency of prescription drug problems, particularly among users of drugs targeted for screening and intervention. Evaluation researchers will use the PSU screener to count drug problems in Iowa, Washington, and in the two non-demonstration States, for the eight criterion sets of Screener Drugs included in the Iowa OPDUR system.⁶ Trends in problem rates from before to during the demonstration, both unadjusted and adjusted for recipient, pharmacy, prescriber, and area characteristics, will be contrasted between treatment and comparison recipients, prescriptions, and pharmacies, to estimate demonstration effects. Separate estimates will be generated for the eight criterion sets of prescription drugs. In RDUR analyses, changes (pre- to - post RDUR) in the frequency of problems per prescription-quarter will be compared between physicians targeted for RDUR and comparison groups, to be selected, for specific drug classes within the Screener Drug group. Principal data sources for these analyses will be Medicaid claims, eligibility, and provider files, and estimates of the frequency of problem prescriptions, derived by combining Medicaid prescription claims with the prescription problem screens included in the evaluation's PSU screener.

Clinical outcomes. DUR should mitigate the severity of or eliminate some fraction of preventable adverse clinical outcomes caused by problem prescriptions. For this evaluation, investigators will select specific clinical outcomes that are relatively frequent in the target population (defined by indication and use of a particular prescription drug), and for which the linkage between a prescription problem and an adverse outcome is documented in the research literature. Two kinds of outcomes analysis will then be conducted. First, trends in the frequency of selected clinical outcomes will be compared between at-risk populations in the treatment and comparison groups of the evaluation. Similar tests will be conducted to assess RDUR effects on adverse outcomes the practices of physicians exposed and not exposed to RDUR interventions. As a second test of the effectiveness of pharmacist CS under PDUR, investigators will select cases from an at-risk population that have experienced adverse outcomes (for example, hospital admissions for a preventable adverse event) within a defined time interval.

⁶ Although CS payments in Washington apply to any prescription that Medicaid will cover, there is currently no widely accepted screening system available for identifying drug problems beyond the UM/PCPS group. Therefore analyses of prescription problems will be confined to these drugs in all states.

Controls will be members of the at-risk population without such adverse events at reference dates matched to case adverse outcomes. "Exposure" in the case-control studies will be defined as documented evidence of CS provided within a given period before the reference dates.⁷ The coefficient of the CS variable in a conditional logit regression equation will provide an estimate of the effectiveness of CS in preventing condition- and drug-specific adverse outcomes. Data will come from Medicaid and Medicare administrative claims and eligibility records; these will be merged with RDUR data, as appropriate, and CS documentation from Iowa and Washington for case-control analyses.

Health services utilization and expenditures. DUR may increase or decrease public (Medicaid and Medicare) health care expenditures. Expenditure effects depend partly upon on how the demonstration alters utilization, including potential substitution effects (of low for high cost prescriptions, of over-the-counter for prescription drugs, of non-drug for drug therapies) and direct effects due to improved health, implying overall reductions in ambulatory visits and hospital admissions. Investigators will study demonstration effects over a range of utilization and expenditure measures for prescription drug, ambulatory, and inpatient hospital services, contrasting unadjusted and adjusted trends between treatment and comparison groups of recipients and pharmacies. Utilization and expenditure effects will also be compared between recipients whose prescriptions have been associated with CS and those without CS. Assessment of RDUR effects on physician practice utilization patterns and expenditures will contrast pre-post trends between exposed and unexposed prescribers.

Access to Medicaid-reimbursed prescription services. The implicit and explicit costs of DUR might cause some prescribers and pharmacies to limit services to Medicaid recipients. Trends in concentration ratios (of Medicaid claims by pharmacy or prescriber), ratios of prescriber availability, and measures of claims volume per pharmacy and prescriber will be compared between treatment and control groups from baseline through the demonstration. Medicaid administrative files will provide data for access analyses.

⁷ Case-control studies of this type can only be conducted in Iowa and Washington, because pharmacies in the co-experimental and comparison states will not be required to document CS services.

Process analyses will address overall program operational measures, as well as indicators specific to the Iowa and Washington demonstrations. In the early stages of both programs, if the demonstration incentives are effective, CS interventions per prescription should increase relative to some baseline rate and problems per prescription should decrease. At some point, however, the demonstration effect on these ratios should dissipate, as incentives to intervene reach some natural limit⁸. Then changes in CS and problem rates should tend to level off or decelerate. In Iowa, rates of OPDUR screen failure should be constant or increase slightly early in the demonstration, associated with more active CS among treatment pharmacies, but there should be a tendency for change both in screen failure and in CS rates to subsequently moderate. The initial increase in CS rates should be high in Washington Group A pharmacies relative to Group B; long term CS rates should be higher in Group A, and problem rates should be lower. Trend analysis and multivariate regression analysis at the recipient, pharmacy, and prescriber levels will be used to track screen failure, CS interventions, and prescription problem rates during the demonstration. Pharmacy and pharmacists' behavior will be associated with attitudes and perceptions of pharmacists (regarding the OPDUR system in Iowa and payments for CS services and documentation in Washington). Data for the process analyses will come from OPDUR/CS program documentation, Medicaid administrative claims and provider data, the PSU screener, and the pharmacy/pharmacist survey.

HCFA's evaluator will survey demonstration pharmacies in Iowa and Washington and samples of pharmacies in the co-experimental and comparison States. Within each pharmacy, all full and part-time pharmacists will be surveyed. This effort will collect information on pharmacy and pharmacist characteristics, and will solicit perceptions and attitudes of pharmacists toward DUR and the provision of CS.

3.4 The Cost-Effectiveness of Medicaid DUR

⁸ Although this statement implies that CS activity and the rate of problem prescribing reach some "steady State," at a level that represents an improvement over the baseline, it should be interpreted as a tendency rather than an observable phenomenon. In reality these ratios can never stabilize. Dynamic changes in pharmacology, drug marketing practices, DUR technology, prescriber practice patterns, and the demographic characteristics of recipient populations will constantly challenge pharmacists' ability to detect and correct problems.

A simulation of the potential cost-savings or cost-effectiveness of alternative DUR models will summarize the evaluation. The evaluation will produce some of the data needed for the simulation (estimates of drug problem rates, effects of CS on prescription and non-prescription expenditures, effects on clinical outcomes, program expenditures); other data will come from the literature and other published data sources. The evaluation will simulate cost-savings of DUR to Medicaid under alternative assumptions about the baseline frequency of prescription problems and other key parameters.

Medicaid cost-savings from the DUR demonstration is defined as net Medicaid expenditure: the sum of total DUR program expenditures (PE), net prescription drug expenditure including effects of the demonstration (NDE), and net non-prescription health services expenditure including effects of the demonstration (NIDE). The demonstration will presumably produce effects by increasing the baseline rate of pharmacists' CS. This means that any Medicaid savings from CS will probably be less than society's savings. Pharmacists have always performed some CS without encouragement from public agencies, and the beneficial effects (better health, fewer hospital admissions, lower health care expenditure) have accrued to all, including the Medicaid program. Under the demonstration, Medicaid has committed to pay for CS, directly in Washington and indirectly through an improved information system in Iowa. These program expenditures will finance both the baseline CS that pharmacists have always provided their Medicaid customer and any increased CS generated by the demonstration; for example, Group A pharmacists in Washington will presumably bill Medicaid for all billable CS. However the gains to Medicaid, in reduced drug and non-drug expenditures, will only come from improvements generated by the demonstration.

Medicaid DUR cost-effectiveness is defined as net Medicaid expenditures (PE+NDE+NIDE) divided by a measure of outcome effect, such as increase in quality-adjusted or unadjusted life years, improvement in a recipient's quality of well-being, reduction in disability days, or reduction in the frequency of an adverse clinical event. This evaluation cannot address mortality and quality of well-being directly. However, the evaluation will apply findings from the outcomes analyses described above to simulate the net expenditures required to achieve reductions in the frequency of preventable clinical events related to drug problems. Since DUR is one of several publicly-supported programs designed to improve clinical outcomes,

estimates of DUR cost-effectiveness will be compared to estimates for other preventive and non-preventive interventions from the research literature.

4.0 IOWA AND WASHINGTON BASELINE CHARACTERISTICS

Both the Iowa and Washington demonstrations have been operating for over 6 months. However, data to estimate demonstration effects will not be available until 1995. Therefore, this chapter presents information on State Medicaid policy and basic expenditure and utilization statistics during a baseline pre-demonstration period, from 1989 through 1993. The next chapter presents data generated by the demonstrations that describe cognitive services (CS) levels and the frequency of OPDUR messages through September 1994.

4.1 State Medicaid Policy in Iowa and Washington (1989-1993)

During the baseline period, Iowa and Washington responded to Federal initiatives by expanding Medicaid eligibility. In addition, both made changes to their lists of covered services and altered payment methods. These changes may be important to the evaluation for two reasons. First, they alter the eligibility and claims data that the evaluator will use. Adjustment for the effects of these changes on total expenditures and on the size and composition of the Medicaid population in each State will be required. Second, changes in payment methods and coverage rules can affect provider participation in Medicaid and the way Medicaid providers treat recipients.

Medicaid Prescription Drug Policies

Iowa's only prescription-related policy initiative broadened prescriptive authority to non-physicians. Washington added a copayment for prescription drugs and established a drug discount program for pharmacy purchasing.

Iowa. Iowa first granted prescriptive authority to nurse practitioners (NPs) and physician assistants (PAs) in 1991 (Iowa Administrative Code Section 147.107)¹. Currently,

¹ In contrast, Washington physician assistants and nurse practitioners have been granted prescriptive authority since 1981. Also, Washington pharmacists have had the authority to prescribe under certain circumstances since 1979. To date, several hundred pharmacists have exercised this authority which is established by protocol agreed upon by a pharmacist in conjunction with a physician. There are approximately 70 to 75 different protocols currently in place, which have been considered for approval by the Board of Pharmacy and remain valid for a two year period after which they are renewable. This practice is authorized by WAC 246-863-100.

NPs may prescribe non-controlled substances independently. Medicaid reimbursement is 80 percent of the physician rate for independent practice and 100 percent if the NP is an employee of a physician or a hospital. PAs are permitted to prescribe Legend III-V controlled substances and, in cases of emergency, Schedule II drugs. Non-controlled substances may also be prescribed by PAs. Prescription drugs may be supplied to patients by PAs only if ordered directly by a physician, if authorized in written protocol, or in cases of emergency. PAs are reimbursed by Medicaid at 75 percent of physician reimbursement rates. Unique provider number or service code modifiers are used to identify PA services on Medicaid claims. It should also be noted that optometrists have restricted prescriptive authority as well (Iowa Administrative Code, Chapter 180: 645-180.200 (155A)).

Washington. Washington increased its maximum allowable charge (MAC) for several drugs in the MAC index in 1991 and 1992, and added a \$1.00 copayment for prescription drugs in 1993.

In addition, the Washington State Legislature approved a prescription drug discount program designed to reduce the biennial Medicaid budget for 1993-95 by \$10.6 million. The Washington State Supplemental Discount Program (WSSDD) went into effect in October 1993. In order to achieve program savings objectives of 5 percent of the estimated drug ingredient cost, a 19 percent discount is to be applied to pharmaceutical manufacturers' OBRA 1990 Requested Rebate Amounts (above a certain dollar amount). To date, about 50 percent of manufacturers have signed the WSSDD agreement. Manufacturers who chose not to sign the agreement have had their products placed on special authorization beginning February 1994. Prescribers have been urged by Washington Medicaid to write prescriptions for products made by participating manufacturers only and, to the maximum extent possible, to allow generic substitution.

The special authorization protocol calls for dispensers to obtain approval for unsigned manufacturer's products by phoning a 24-hour toll-free number. Each new prescription and each new refill require new authorization numbers. An Automated Voice Response System has been implemented to speed the approval process for prior approval produced by non-participating manufacturers. It should be noted that, although approval is necessary prior to submission of a payment claim, it is not necessary to obtain approval in order to dispense the drug itself.

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The WSSDD system currently receives approximately 4,000 to 5,000 calls per day (Holmes, telephone conversation, April 1, 1994). One nursing home alone placed 200 calls per day for special authorization and at least one pharmacy serving 75 percent Medicaid patients has left the Washington demonstration because of inconveniences associated with WSSDD (Andrews, phone conversation, April 4, 1994).

Other Medicaid Policies

Eligibility Expansions

Both Iowa and Washington responded to Federal mandates to expand eligibility to: 1) Qualified Medicare Beneficiaries (QMBs), low-income elderly individuals not eligible for Medicaid for whom the States must pay Medicare deductibles and copayments and 2) low-income pregnant women and children not eligible under the usual Medicaid categories. States had some discretion regarding the pace and extent of expansion for women and children, and Iowa and Washington differed somewhat in this regard during the baseline period.

Iowa. In Iowa, pregnant women and infants with incomes below 150 percent of the Federal Poverty Level (FPL) were eligible for Medicaid in 1989; income limits were expanded in 1990 to 185 percent of the FPL. Families with children up to age 2 in families with incomes below the FPL were covered in 1989. In 1990, the program added families with children up to age 8 (born after September 30, 1983) in families with incomes below the FPL.

Washington. Washington expanded coverage for pregnant women and children to 185 percent of the FPL one year earlier than Iowa (1989). In the same year, Washington added coverage for families with children under 8 (born after September 30, 1983) in households with incomes below the FPL. In 1992, Washington added families with children under age 19 living in families with incomes below the FPL.

Medicaid Service Coverage and Reimbursement

During the baseline period, both Iowa and Washington added coverage for certain long term and custodial services.

Iowa. Iowa began covering rehabilitative services for medically-needy individuals in 1990 (extended to the categorically-needy in 1992), hospice care for both medically- and categorically-needy (1990), and nursing facility services for eligible elderly individuals in mental institutions (1993). However, during the baseline period, Iowa made no major changes in reimbursement levels or payment methods.

Washington. Washington added personal care and hospice care for categorically-needy individuals in 1990. In addition to the prescription drug copayment and MAC changes already noted, Washington also made several revisions to its payment system.

For pregnant, clinically-dependent women Washington changed in 1989 from per-case DRG payment to payment at a percent of billed charges. In 1993, Washington rebased its DRG system to an average historical cost per discharge adjusted for case mix and indexed to the current fiscal year.

The reimbursement methodology for providers changed in 1990 from fee schedule to usual and customary charges, and a \$1.00 co-pay was instituted for physician visits in 1993. Since 1990, rural health clinics, hospices, and clinical labs have followed a reimbursement methodology based on a rate per visit established by the Medicare carrier. Finally, Washington Medicaid paid for home health care under a State-wide fee schedule in 1989, but switched in 1990 to a per visit rate with the upper limit set at prevailing charges.

Managed Care

Expansion of voluntary or mandated managed care in the Iowa and Washington Medicaid programs poses two challenges to the demonstration evaluation. First, it effectively compromises the value of an important Medicaid data source, the Medicaid Management Information System (MMIS), for either (or both) prescription drug and non-drug expenditures and utilization by eliminating the administrative claim record from the system (although, since prescription drug claims will not be covered under the Medicaid capitation payment for many plans, prescription drug claims will be available for these enrollees). Second, it adds an influence (managed care and the incentives in prepaid care to minimize utilization and cost) that could confound estimates of demonstration effects. Both Iowa and Washington have Medicaid

managed care programs in place, largely for AFDC populations, with plans to expand managed care enrollment over the next few years. In order to guard against cost risks that might be difficult to manage, few Medicaid managed care plans cover prescription drugs. However, DUR applied to fee-for-service drug utilization of Medicaid managed care enrollees can lead to improved plan performance, if costs of preventable medical conditions related to misprescribing are reduced.

Iowa. Iowa Medicaid managed care enrollment in all plans combined totaled 93,834 for the year beginning July 1993 and extending to April 1994. No prescription drugs are currently covered for Medicaid enrollees in these HMO contracts.

Washington. By November 1993, there were 11 HMOs and other prepaid health plans in Washington that served Medicaid eligibles. These plans are collectively known as the "Healthy Options Program". Enrollment is mandatory in most areas of the State, under terms of a HCFA waiver granted in 1986 and amended in 1987 which requires all AFDC recipients in a geographic area to enroll in managed health care systems. Recipients are required to choose between two or more plans in a county with no fee-for-service option (Washington Medicaid Annual Report, 1988).

Only two plans with drug benefits were part of the Healthy Options Program in 1994: Ethix and Pierce. Given that plans with a drug benefit enrolled approximately 18 percent of all AFDC Medicaid recipients, their impact on the demonstration was expected to be minimal (Christensen, May 18, 1994, telephone conversation). However, on March 1, 1995, a policy change went into effect requiring all Healthy Options program providers to include drug coverage. The enrollment of AFDC Medicaid recipients with drug coverage is expected to dramatically increase. Healthy Options providers are required to submit medical care utilization and prescription claims data to Medicaid according to a standard minimum data set. Participating pharmacists have been reminded that they should continue to document and bill for CS for these patients in the usual manner. The quality and accessibility of these managed care data will be assessed during the course of the evaluation.

4.2 Baseline Medicaid Data: Iowa and Washington

The evaluation of DUR will compare trends in Medicaid expenditures and the health services utilization of Medicaid enrollees, between a baseline period from 1989 through 1993, the year immediately preceding implementation of the Iowa and Washington demonstrations. This section presents summary data both to characterize levels and changes in key expenditure and eligibility data over the period in the two demonstration States and to compare the pharmacies that have agreed to participate in the demonstrations with all pharmacies in the two States.

The exhibits described below present the following statistics:

1. **Medicaid expenditures:** Total Medicaid expenditures is divided into *prescription drug expenditures*, an inclusive category of *institutional expenditures*, which includes all facility payments to hospitals and nursing homes, and *professional and other payments*, including payments to medical practitioners, regardless of setting, and payments to suppliers of services and medical products in ambulatory settings, and home health payments.
2. **Medicaid eligibility categories:** These are broadly defined by age and disabled status, rather than categorical and other reasons for Medicaid eligibility, and include: children (under age 20), non-disabled and disabled adults (age 20 through 64) and aged recipients (age 65 and above).
3. **Screeners Drug expenditures and prescriptions:** The drug categories that will be studied in this evaluation include groups for which the University of Maryland and the Philadelphia College of Pharmacy and Science (UM/PCPS) developed screens: as described earlier, Iowa's screens currently apply only to Screener Drug categories. These drug categories include: NSAIDs, H2 receptor antagonists, digoxin, calcium channel blockers, benzodiazepines, antipsychotics, antidepressants, and ACE inhibitors.

Iowa

Between 1989 and 1993, total Medicaid expenditures in Iowa grew from \$541 to \$877 million, a total increase that exceeded 62 percent. During this period, the composition of Iowa Medicaid expenditures, with respect to categories of services and eligibility, changed marginally.

Expenditures for Medicaid-reimbursed services. Prescription drug expenditures also increased slightly, from 8.9 to 9.7 percent. (See Exhibit 4.1) Medicaid expenditures for

Exhibit 4.1
Total Medicaid Expenditures (1989-1993)
 Iowa

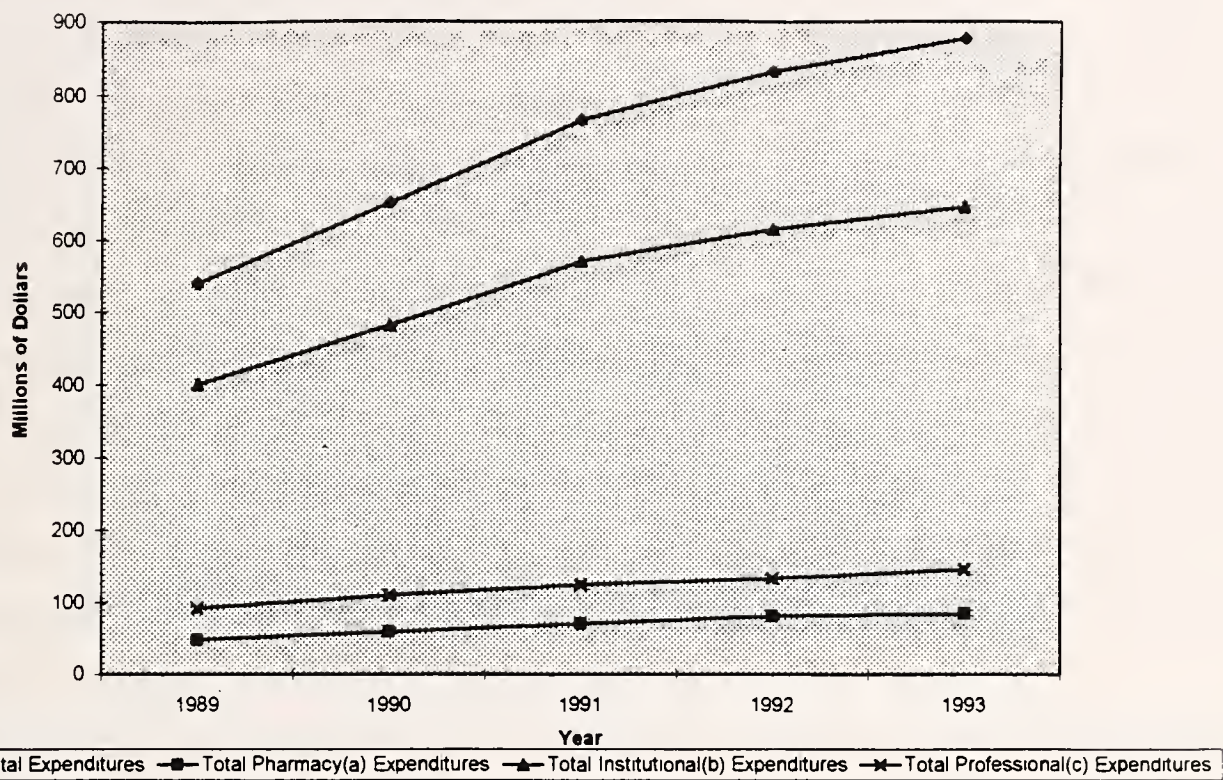
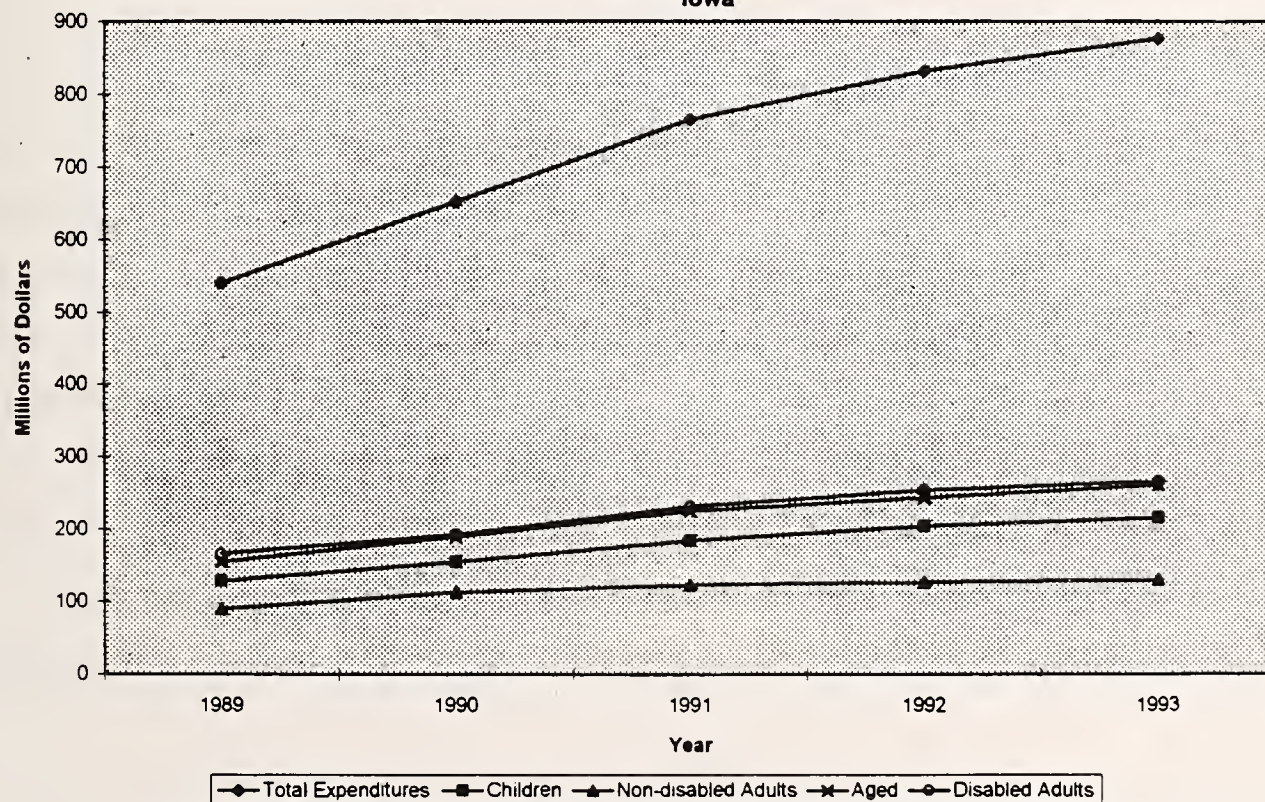


Exhibit 4.2
Total Medicaid Expenditures by Eligibility Category (1989-1993)
 Iowa





institutional services declined from 74.1 to 73.7 percent of the total, while professional and other expenditures declined from 17.0 to 16.6 percent.

Expenditures by Medicaid-enrolled group. About one-half of Iowa Medicaid enrollees during the baseline period were children, but Medicaid children used services that incurred slightly less than one-quarter of all Medicaid expenditures. (Exhibits 4.2 and 4.3) In contrast, disabled adults and aged recipients together constituted about one-quarter of all recipients but incurred nearly 60 percent of total expenditures. This evaluation will study effects of the demonstration among the elderly and adult disabled, recognizing that these individuals are at high risk of multiple chronic conditions and frequent acute medical events, and the intensive use of many prescription drugs may increase the risk of potentially damaging, but preventable, prescription errors. Over the baseline period in Iowa, the percentage of aged recipients declined slightly, from 15.3 to 13.6 percent, but the percentage of disabled adults increased slightly, from 10.2 to 10.4 percent. The expenditure share of aged and adult disabled recipients remained stable at about 60 percent throughout the baseline period.

Screeners Drug Expenditures and Prescriptions. As Exhibit 4.4 shows, most of Iowa Medicaid's payments for Screener Drugs cover prescriptions filled by aged recipients. Their share declined slightly, from about 52 to 50 percent. Disabled adults incurred the next largest share, over 30 percent, followed by non-disabled adults (about 15 percent) and children (2 to 3 percent). Shares rose for children and disabled adults over this period.

Pharmacies participating in the Iowa demonstration dispensed Screener Drugs worth \$4 million in 1989, compared to \$14.8 million for all Iowa pharmacies. (Exhibit 4.5) Total Medicaid Screener Drug prescription payments grew by 50 percent from 1989 to 1993 in demonstration and all Iowa pharmacies, while total Medicaid prescription drug payments grew by 70 percent. Over the same period, payments per Screener Drug prescription user increased for all pharmacies by 9 percent and for demonstration pharmacies by somewhat more than one percent. The number of Screener Drug prescriptions per user dispensed each year actually declined, from 9.8 to 9.3 in all pharmacies, and from 8.6 to 7.4 in demonstration pharmacies.

Medicaid Screener Drug expenditures, as a percent of all Medicaid prescription drug expenditures, fell over the baseline in all pharmacies (from 30.9 to 25.9 percent) and in



Exhibit 4.3
Total Medicaid Recipients by Eligibility Category (1989-1993)
 Iowa

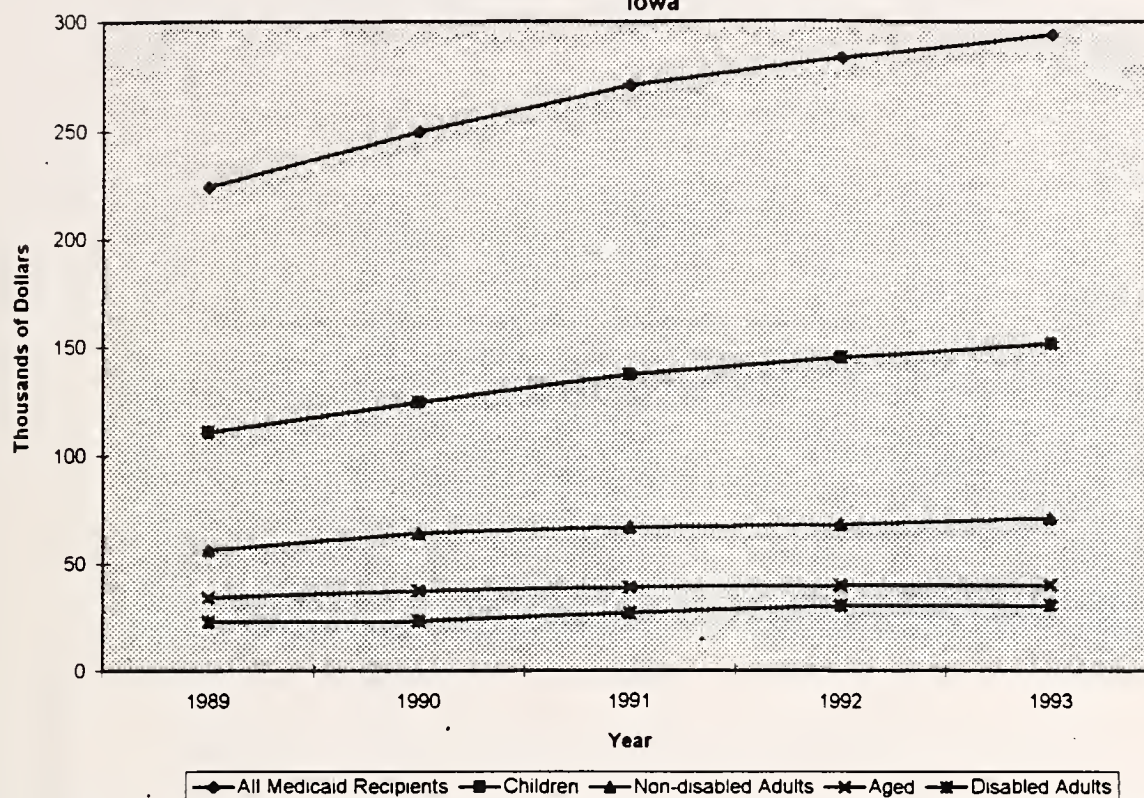


Exhibit 4.4
Percentage of Total Medicaid Screener Drug Expenditures by Eligibility Category (1989-1993)
 Iowa

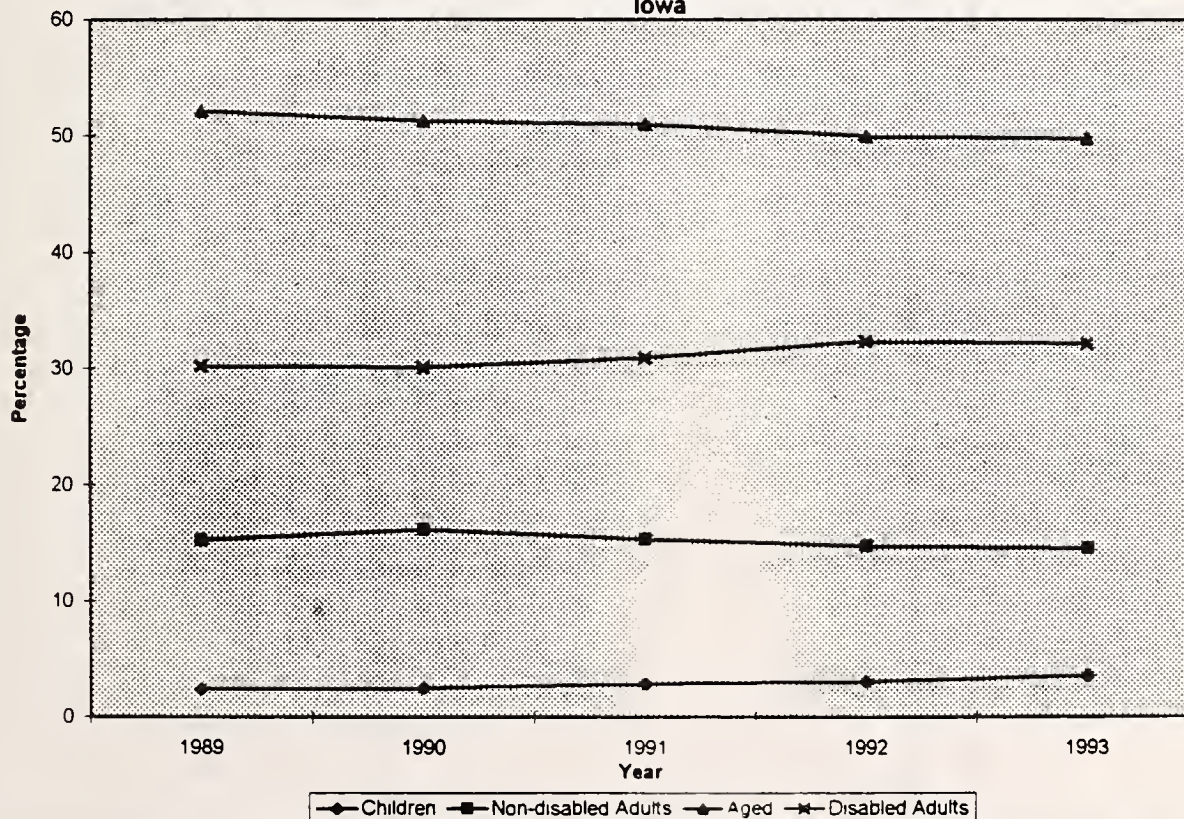


Exhibit 4.5

Screener Drug Summary Statistics*
Iowa
(1989-1993)

	1989		1990		1991		1992		1993	
	All Pharmacies	Demonstration Pharmacies	All Pharmacies	Demonstration Pharmacies	All Pharmacies	Demonstration Pharmacies	All Pharmacies	Demonstration Pharmacies	All Pharmacies	Demonstration Pharmacies
Total Screener Drug Expenditures (millions)	\$14.8	\$4.0	\$18.2	\$4.9	\$21.5	\$5.8	\$24.3	\$6.5	\$22.0	\$6.0
Screener Drug Expenditures/ Prescription User	\$225	\$197	\$247	\$218	\$268	\$232	\$285	\$243	\$246	\$200
Number of Screener Drug Prescriptions/ Screener Drug Recipient	9.8	8.6	9.7	8.4	9.6	8.1	9.7	8.1	9.3	7.4

*Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.

demonstration pharmacies (from 31.0 to 26.1 percent). (Exhibit 4.6). Exhibits 4.7 and 4.8 also show changes in the composition of Medicaid Screener Drug expenditures and prescriptions. As a percent of total Medicaid Screener Drug (Appendix A) expenditures, expenditures for calcium channel blockers, antidepressants, and ACE inhibitors increased for both all and demonstration pharmacies, while expenditures for NSAIDs, benzodiazepines, and antipsychotics decreased. Expenditures for H2 receptor antagonists and digoxin remained relatively constant. Changes in percent by prescription volume generally reflected expenditure changes.

Washington

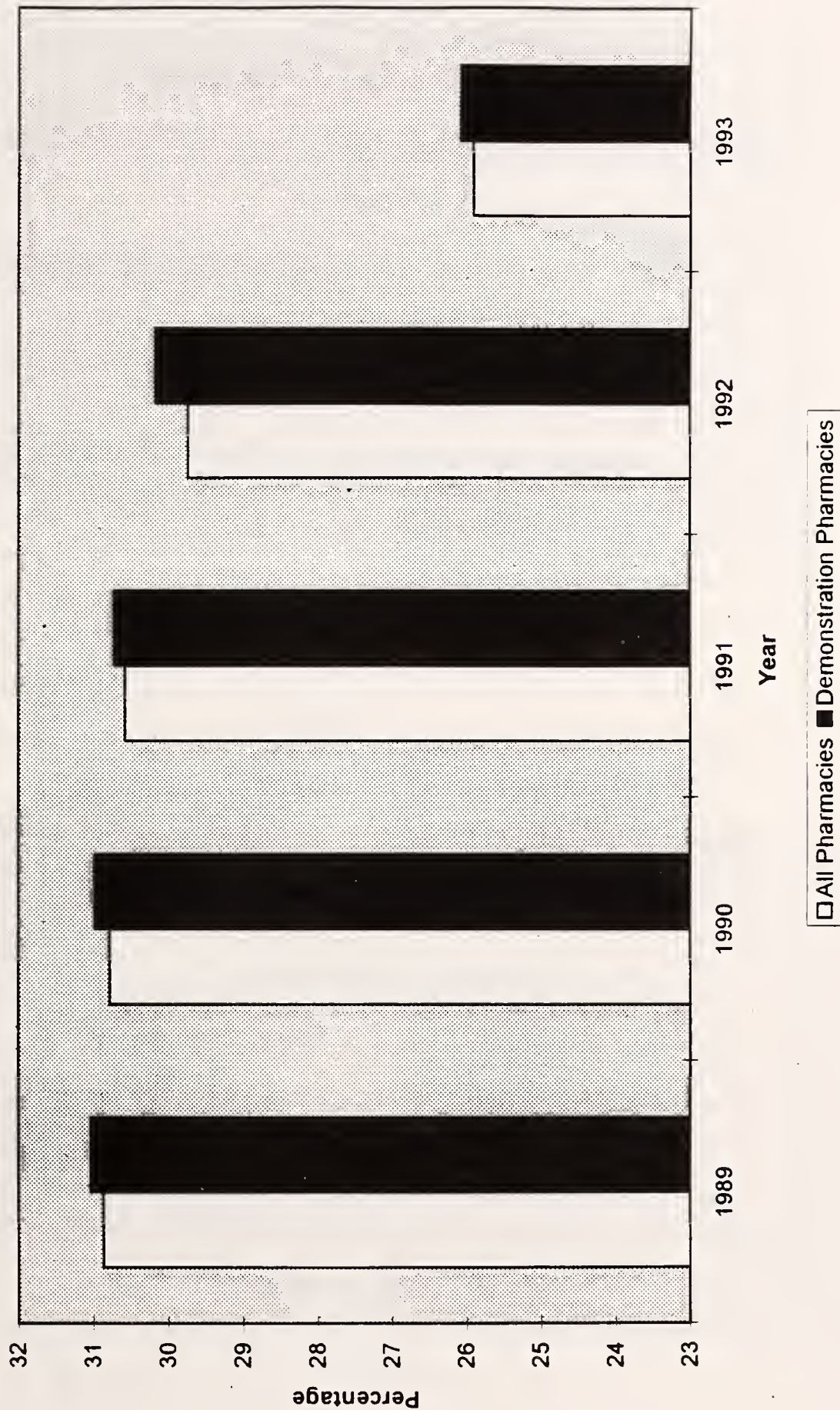
Between 1989 and 1993, total Medicaid expenditures in Washington grew from \$827 million to \$1.6 billion, an increase of roughly 96 percent. During this period, the composition of Washington Medicaid expenditures, with respect to categories of services and eligibility, changed substantially.

Expenditures for Medicaid-reimbursed services. Professional services captured an increasing share of Medicaid expenditures in Washington, growing from 26.1 to 33.6 percent of the total (Exhibit 4.9). The prescription drug expenditure share also increased, from 8.1 to 10.2 percent. Medicaid expenditures for institutional services declined from 65.8 to 56.2 percent of the total.

Expenditures by Medicaid-enrolled group. About one-half of Washington Medicaid enrollees during the baseline period were children, but Medicaid children used services that incurred less than one-quarter of all Medicaid expenditures (Exhibits 4.10 and 4.11), although their share increased from 19.0 to 23.6 percent. Non-disabled adults increased as a percent of all recipients, from 31.4 to 32.7 percent, and increased their share of expenditures from 24.0 to 32.7 percent. Disabled adults and aged recipients were about 20 percent of the recipient population in 1989 and incurred over half of all Medicaid expenditures, but their share of recipients and expenditures dropped throughout the baseline period.

Screener Drug Expenditures and Prescriptions. As Exhibit 4.12 shows, most of Washington Medicaid's payments for Screener Drugs covered prescriptions filled by aged recipients in 1989 (40 percent), but over the baseline, their share declined to 35 percent and non-disabled adults claimed the largest share (40.9 percent). Shares of expenditures dropped for disabled adults, but rose slightly for children.

Exhibit 4.6
Percentage of Total Medicaid Screener Drug Expenditures for All and Demonstration
Pharmacies (1989-1993)
Iowa



Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients

Exhibit 4.7
Percentage of Total Medicaid Screener Drug Expenditures for All and Demonstration Pharmacies
by Drug Class (1989,1993)

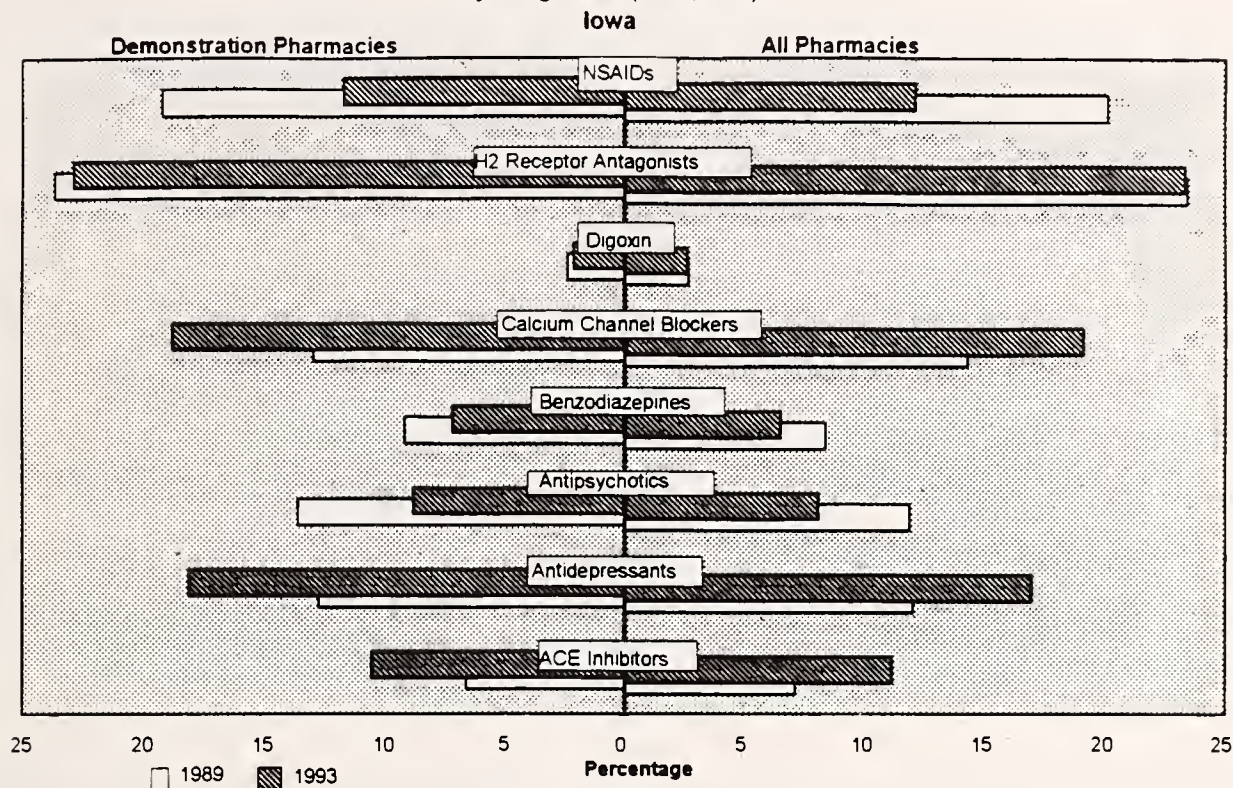


Exhibit 4.8
Percentage of Total Medicaid Screener Prescription Volume for All and Demonstration Pharmacies
by Drug Class (1989,1993)

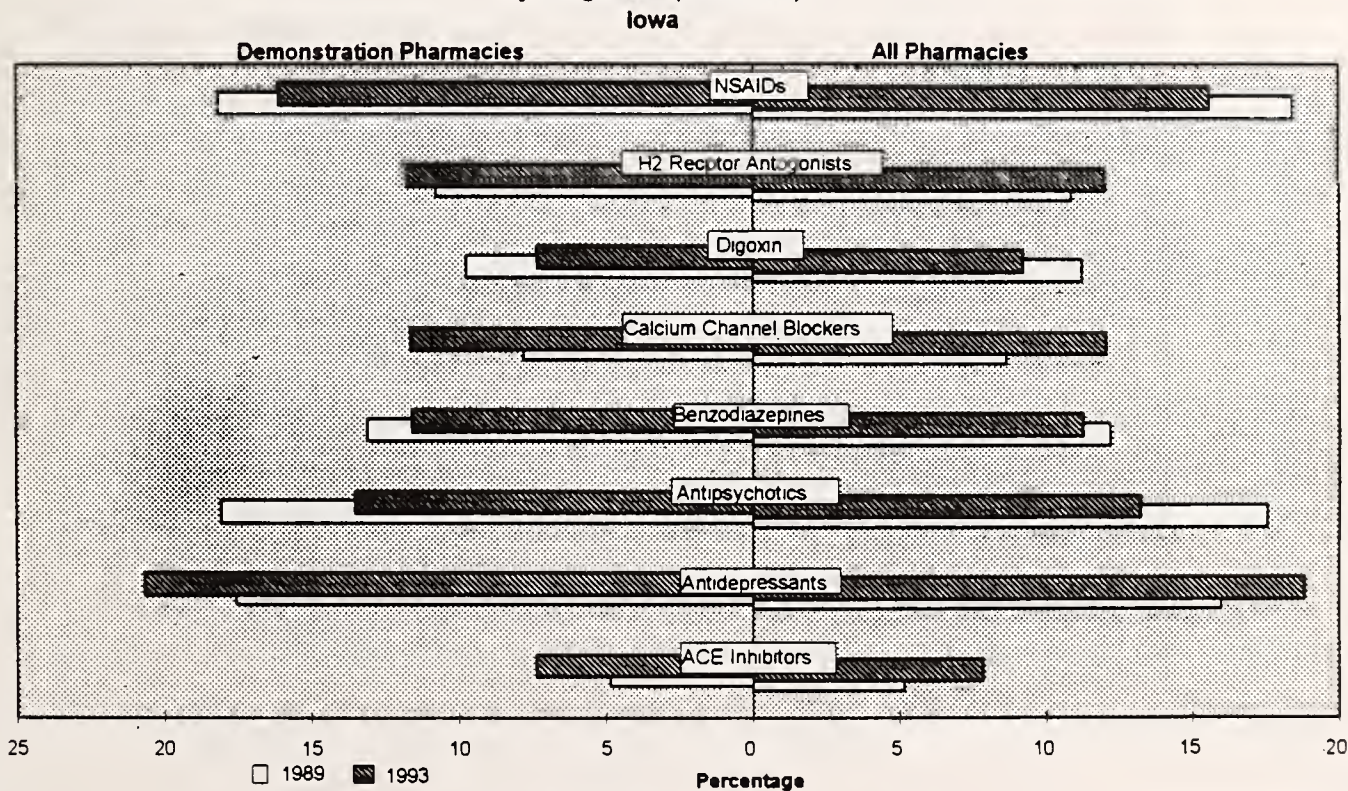


Exhibit 4.9
Total Medicaid Expenditures (1989-1993)
Washington

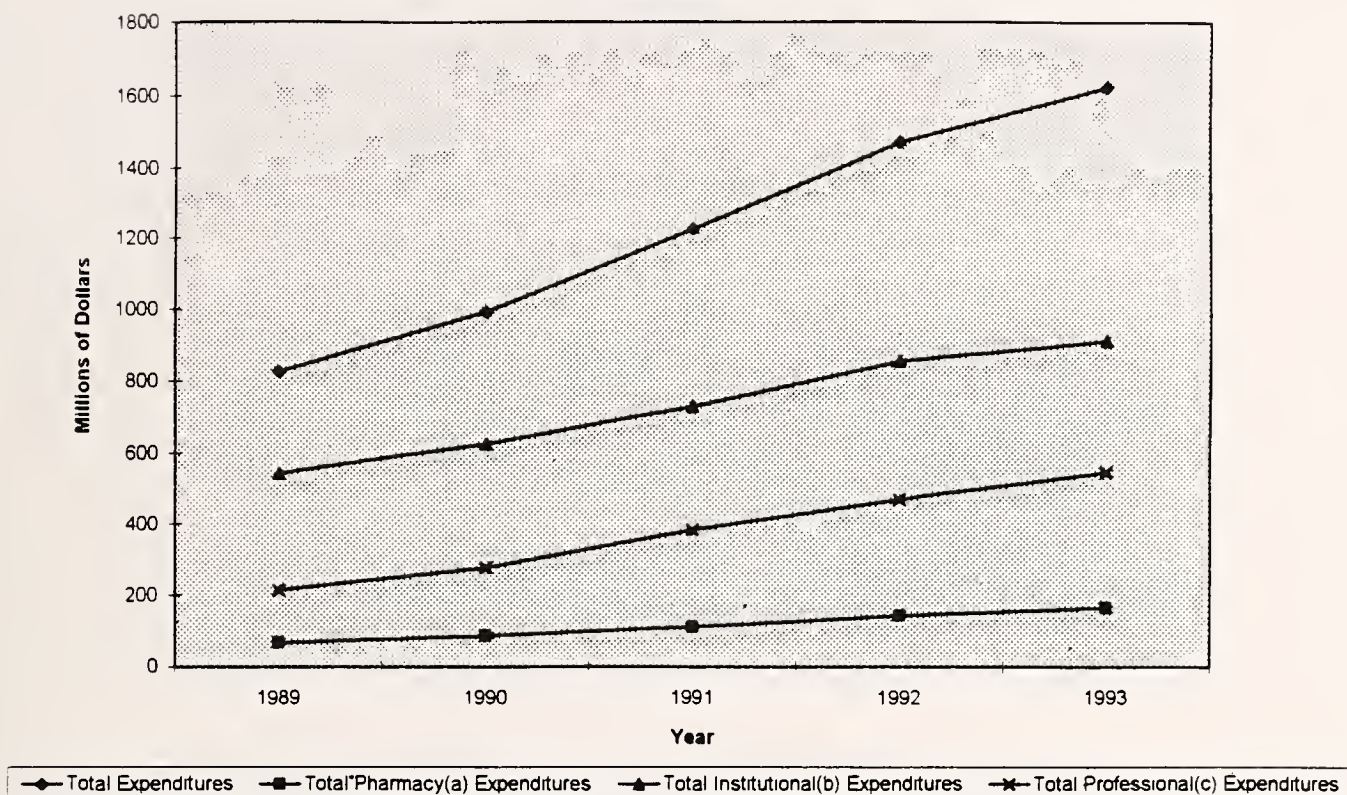


Exhibit 4.10
Total Medicaid Expenditures by Eligibility Category (1989-1993)
Washington

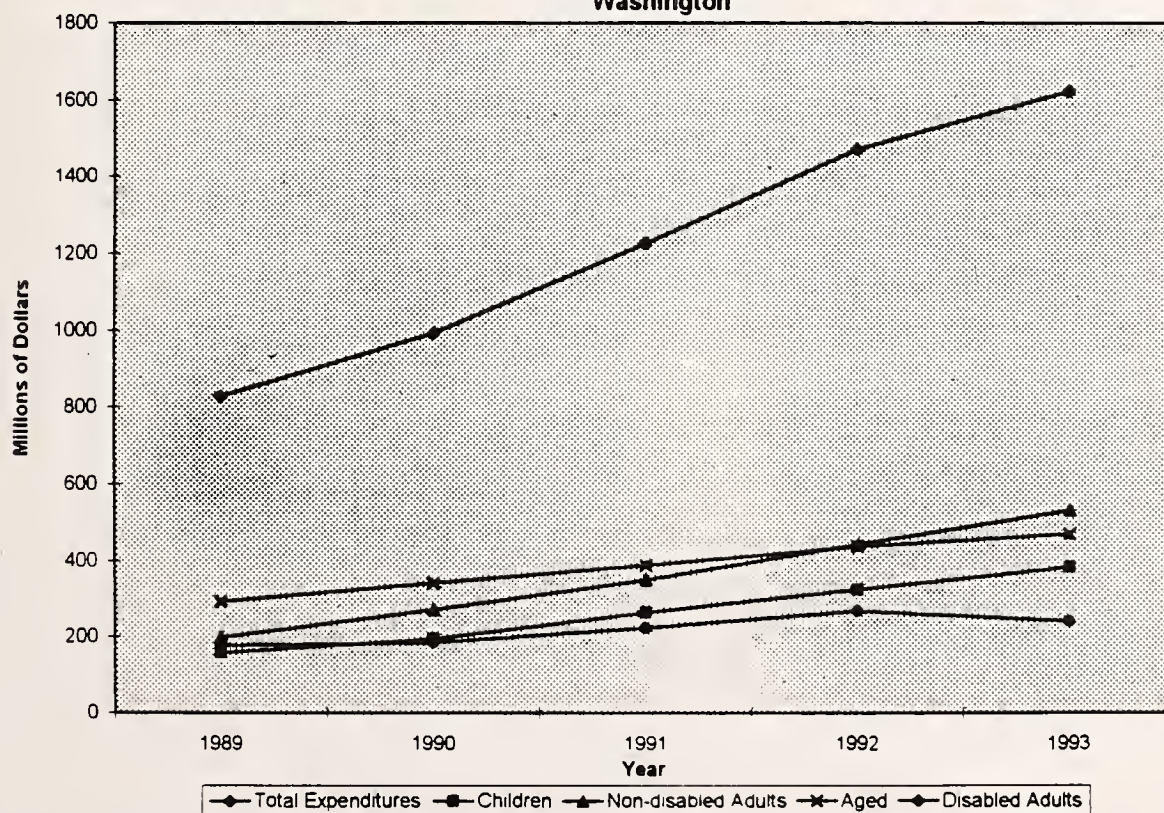


Exhibit 4.11
Total Medicaid Recipients by Eligibility Category (1989-1993)
Washington

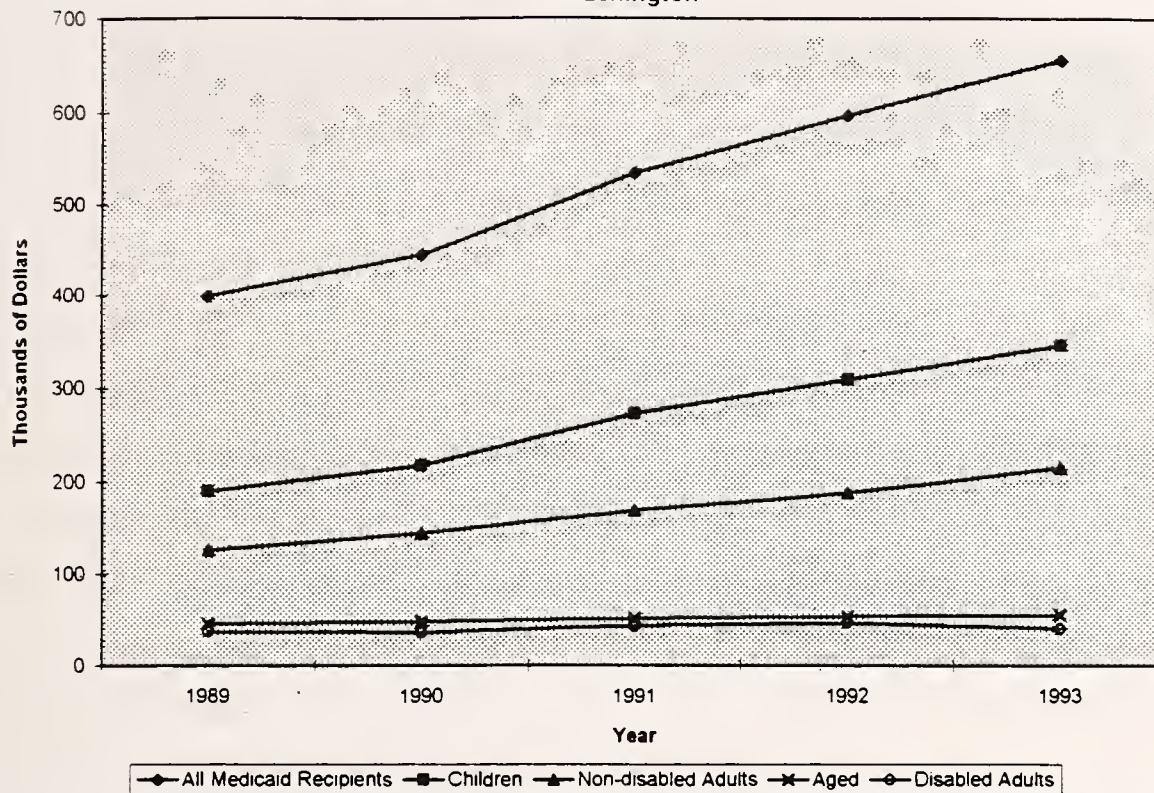
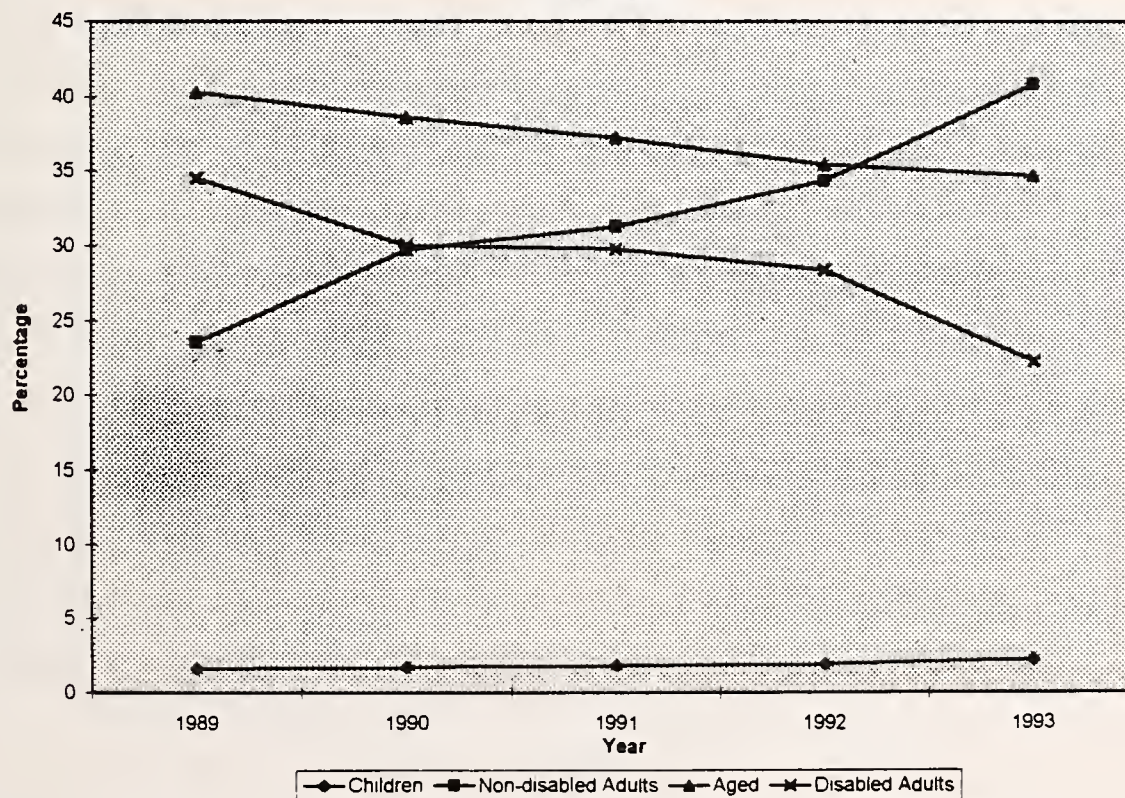


Exhibit 4.12
Percentage of Total Medicaid Screener Drug Expenditures by Eligibility Category (1989-1993)
Washington



Pharmacies participating in the Washington demonstration dispensed Screener Drugs worth \$8 million in 1993, compared to \$44.2 million for all Washington pharmacies. (Exhibit 4.13) Total Medicaid Screener Drug prescription payments grew by over 200 percent from 1989 to 1993 in all Washington pharmacies, roughly the same growth rate of total Medicaid drug expenditures, and by nearly 300 percent in demonstration pharmacies. Over the same period, payments per Screener Drug prescription user increased for all pharmacies by 36 percent and for demonstration pharmacies by somewhat more than 45 percent. The number of Screener Drug prescriptions per user each year increased in all pharmacies, from 7.6 to 8.4 in all pharmacies, and from 5.1 to 5.4 in demonstration pharmacies.

Medicaid Screener Drug expenditures, as a percent of all Medicaid prescription drug expenditures, decreased slightly over the baseline in all pharmacies (from 30.9 to 26.7 percent) and fell in demonstration pharmacies (29.9 to 27.8 percent). (Exhibit 4.14). Exhibits 4.15 and 4.16 also show changes in the composition of Medicaid Screener Drug expenditures and prescriptions. As a percent of total Medicaid Screener Drug expenditures, for calcium channel blockers, antidepressants, H2 receptor antagonists, and ACE inhibitors increased for both all and demonstration pharmacies, while expenditures for NSAIDs, benzodiazepines, and antipsychotics decreased. Expenditures for digoxin remained relatively constant. Changes in percent by prescription volume generally reflected expenditure changes.

4.3 Conclusion

During the baseline period (1989-1993), before Iowa and Washington implemented the DUR demonstrations, there were few important Medicaid policy changes in the two demonstration States that could be expected to affect the demonstration. Two exceptions to this generalization should be noted. First, Washington's imposition of a mandatory rebate program for Medicaid prescription drugs may have complicated relations between the Washington demonstration program and participating pharmacies; the longer term implications of this policy for the continued participation of these pharmacies is currently unknown. Second, both Iowa and Washington expanded managed care options for eligible women and infants, and noted plans to add managed care as an option for other eligibility groups at later dates. These policies have 4.13 implications both for the research design,

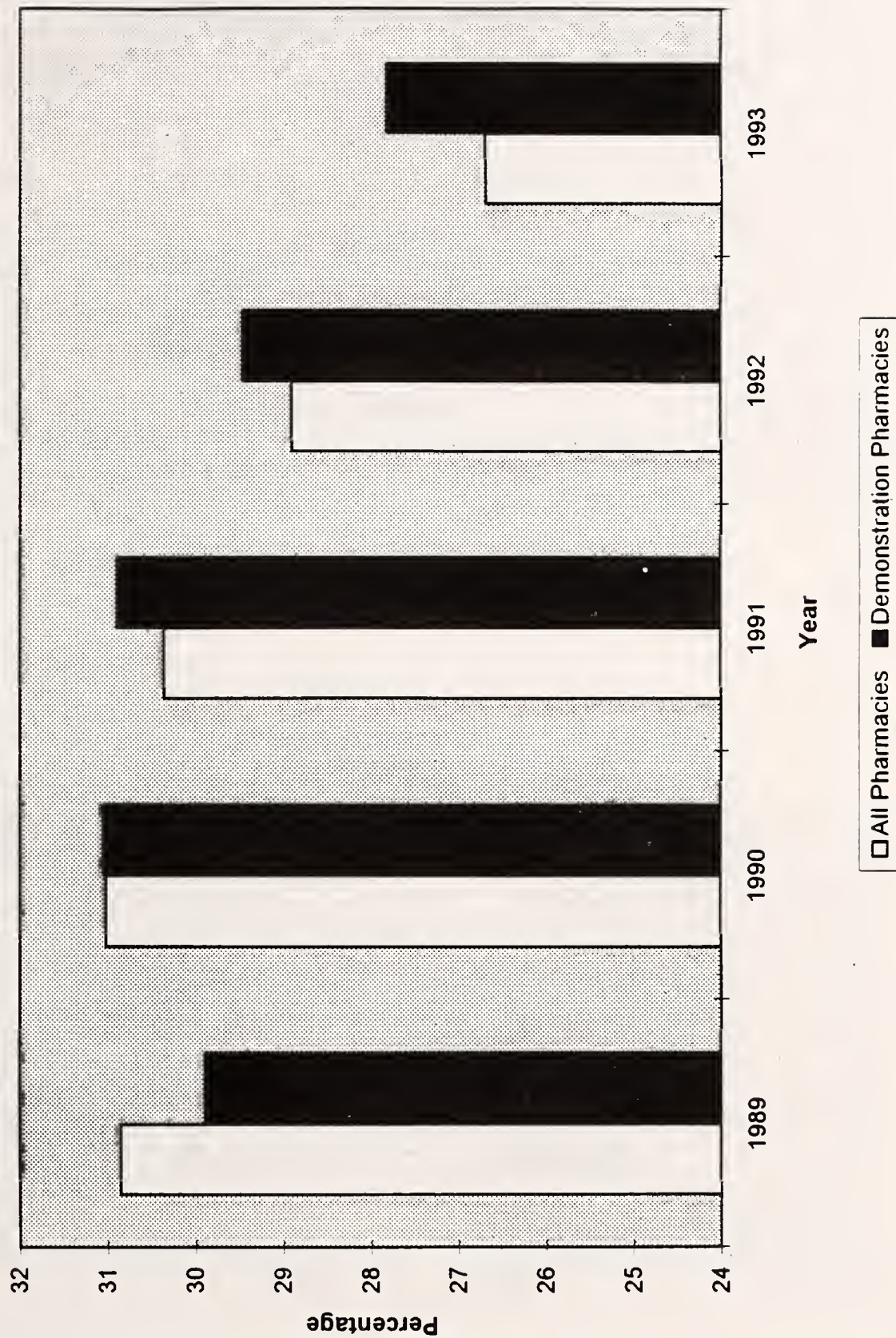
Exhibit 4.13

Screener Drug Summary Statistics*
Washington
(1989-1993)

	1989		1990		1991		1992		1993	
	All Pharmacies	Demonstration Pharmacies	All Pharmacies	Demonstration Pharmacies	All Pharmacies	Demonstration Pharmacies	All Pharmacies	Demonstration Pharmacies	All Pharmacies	Demonstration Pharmacies
Total Screener Drug Expenditures (millions)	\$20.8	\$2.7	\$27.1	\$3.4	\$34.1	\$5.3	\$41.3	\$7.0	\$44.2	\$8.0
Screener Drug Expenditures/ Screener Drug Prescription User	\$188	\$134	\$221	\$160	\$240	\$176	\$253	\$188	\$255	\$194
Number of Screener Drug Prescriptions/ Screener Drug Recipient	7.6	5.1	8.7	5.9	8.2	5.7	7.7	5.4	8.4	5.4

*Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients.

Exhibit 4.14
Percentage of Total Medicaid Screener Drug Expenditures for All and Demonstration
Pharmacies (1989-1993)
Washington



Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients.

Exhibit 4.15
Percentage of Total Medicaid Screener Drug Expenditures for All and Demonstration Pharmacies
by Drug Class (1989, 1993)
Washington

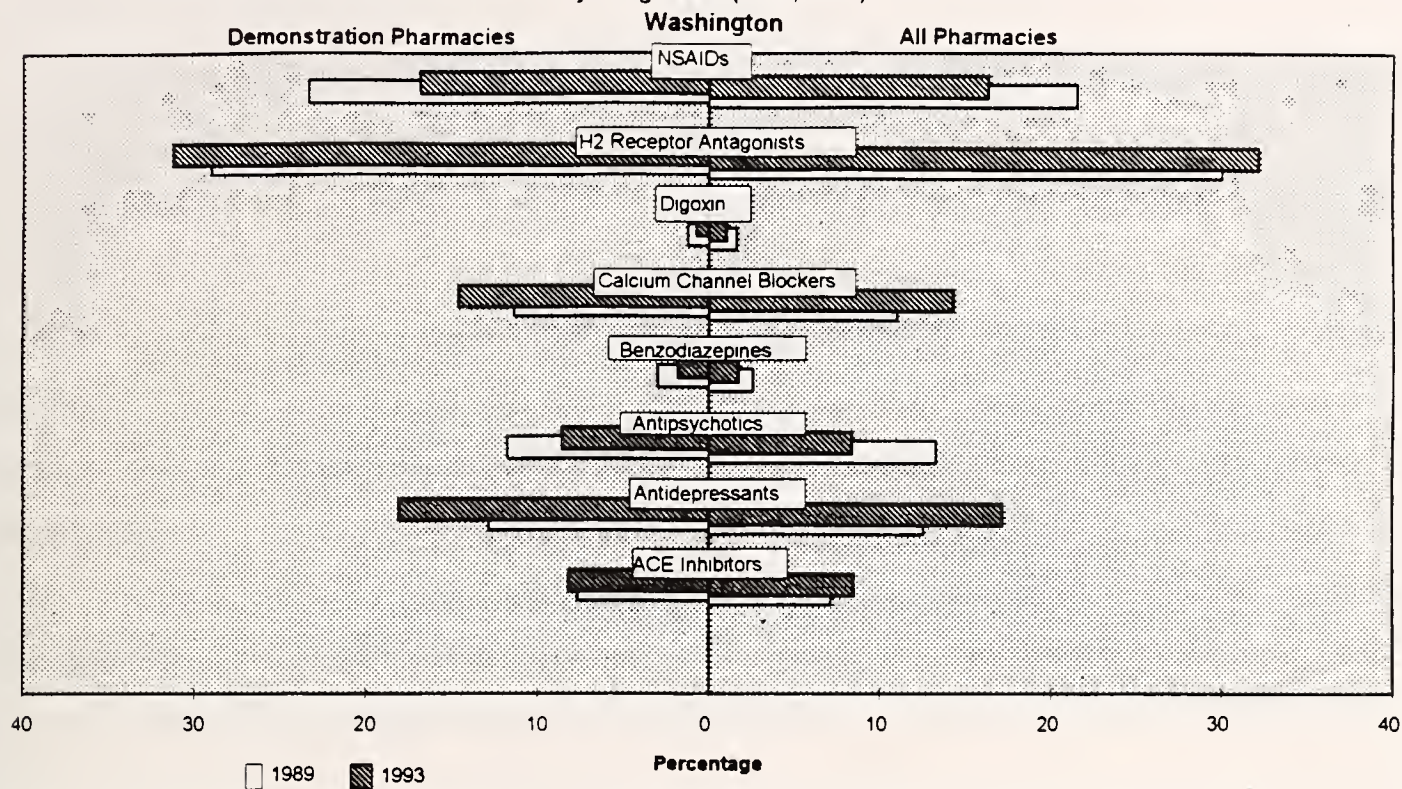
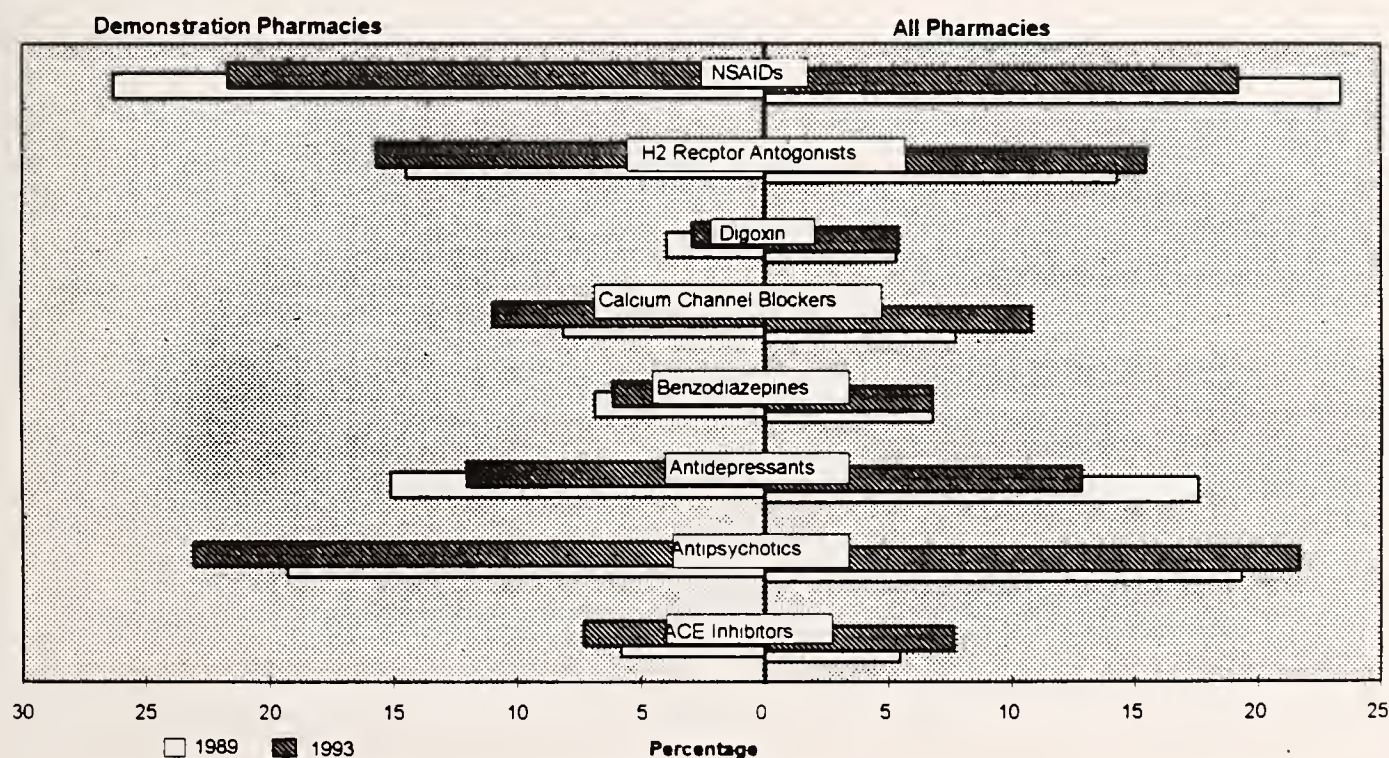


Exhibit 4.16
Percentage of Total Medicaid Screener Prescription Volume for All and Demonstration Pharmacies
by Drug Class (1989, 1993)
Washington



Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients



in terms of managed care influences on health services utilization, and for data completeness, to the extent that managed care records that are comparable to Medicaid claims may not be accessible to the evaluation.

In a context of rapidly increasing Medicaid expenditures and recipient coverage, prescription drugs claimed a larger share of the total in both States. As a proportion of total prescription drug expenditures, the share of Screener Drugs, that is the focus of this evaluation, decreased over the baseline period. This represented, in part, a decline in the proportion of eligible recipients who have been high users of Screener Drugs, the elderly and adult disabled recipients. These trends do not threaten the evaluation in any way, because the number of prescriptions and recipients on which this evaluation focuses are growing in both States in absolute terms. However it does suggest that Medicaid programs in these and in other States should review their assumptions about what kinds of drugs and types of screens should be incorporated in computerized DUR systems in the future, in order to more effectively address potential prescription problems among rapidly increasing recipient groups.

5.0 PLANS FOR DATA COLLECTION AND ANALYSIS

HCFA's evaluation of the Medicaid DUR demonstrations will end in March 1998. The operational phases of the demonstrations differ in length between Iowa and Washington. Iowa will operate its demonstration for three years from June 1994. Washington will operate for 18 months from February 1994. Therefore, the evaluation will design data collection, analysis, and reporting tasks to extract the maximum available information throughout the time periods of both States' demonstrations.

5.1 Primary Data Collection

Three primary data collection tasks are planned: a survey of pharmacies and pharmacists in Iowa and Washington and in the two non-demonstration States; two waves of site visits, including pharmacy and prescriber focus groups in the two demonstration States; and a review of all 50 States' mandated annual Medicaid DUR reports. Primary data collection will begin in spring 1995.

The first pharmacy/pharmacist survey will be conducted in Washington in late spring of 1995. Because Washington recruited pharmacies through the fall of 1994, potential respondents to the survey will have had different lengths of exposure to the demonstration. Therefore, the survey sample will be restricted to pharmacies with at least one full year of participation in the demonstration.

Iowa implemented the OPDUR demonstration several months later than Washington, and so the evaluation will conduct the Iowa pharmacy/pharmacist survey in spring of 1996. To be eligible for the survey, a demonstration pharmacy in Iowa must have participated for at least a year. Unless Iowa undertakes additional pharmacy recruitment in 1995, all pharmacies in the demonstration by the end of December 1994 will be eligible to be surveyed. At the same time, the evaluator will survey 100 pharmacies each in the co-experimental and comparison States. Sampling of non-demonstration pharmacies will be random and stratified to replicate the distribution of Iowa demonstration pharmacies' Medicaid claims volumes.

HCFA's evaluator will conduct two rounds of site visits to the demonstration States in the fall of 1995 and one in the spring of 1997. These visits will fulfill several purposes. Project staff will interview key officials in the demonstration and relevant state agencies, to fully

describe achievements and barriers to the success of the two demonstrations. Staff will conduct focus groups with prescribers and pharmacists. These focus group sessions will be designed to gain insights into perceptions of the two demonstration interventions and other State Medicaid DUR policies and programs, as well as suggestions for alternative approaches to controlling misprescribing in the Medicaid program. Project staff will also work with members of State DUR boards, to identify RDUR interventions and data sources that could be acquired and analyzed for the evaluation.

Finally, the evaluator will review annual State Medicaid DUR reports during each year of the evaluation. Of particular interest will be State initiatives in planning for and implementing OPDUR systems and developments in RDUR programs. Findings from these reviews will provide programmatic background for each Annual Report and the Final Report of the evaluation.

5.2 Secondary Data Acquisition and Analyses

During each year of the evaluation, HCFA's evaluator will receive and process the complete State Medicaid Management Information System (MMIS) files from Iowa, Washington, and the two non-demonstration States. These data provide complete Medicaid claims and eligibility records, as well as information on Medicaid providers, for these States. Records for Iowa and Washington demonstration participants (recipients, pharmacies, and providers) will be identified. The evaluator will also acquire from HCFA Medicare enrollment and claims data for those recipients who are dually eligible for Medicare and Medicaid.

Each demonstration will produce data that records the level of activity within the program (CS claims and documentation records in Washington, OPDUR clinical events data and CS documentation records in Iowa). The evaluator will obtain these data as well, and attempt to link them to claims and eligibility data for each demonstration recipient.

As described earlier in this report, the evaluation has developed a system for screening prescription claims and determining the likely presence of a prescription "problem" in the demonstration and non-demonstration States. This system, described earlier as the PSU Screener, will be part of the analytic data base and will be updated each year of the



demonstration to accommodate new drugs and new information about potential problems within the core set of drug classes.

Statistical analyses of the Medicaid DUR secondary data base will be conducted each year of the demonstration. A final analysis of the Washington demonstration will be produced in 1997. Iowa's demonstration will be fully evaluated in the Final Report, in 1998.

5.3 Project Reports

For HCFA's cross-cutting evaluation, there remain three Annual Reports and a Final Report. The evaluator will submit Annual Reports to HCFA each May. The Final Report is due in March 1998. Both Iowa and Washington will submit their own evaluation reports to HCFA at the close of their demonstrations.

The 1995 Annual Report will contain preliminary statistical analyses of baseline and demonstration data, and will include frequencies of estimated prescription drug problems in the two demonstration States over the baseline period.

In 1996, the Washington demonstration will have ended, so that the Annual Report will contain a complete evaluation of the Washington CS payment intervention, including information based on the Washington site visit, the Washington pharmacy/pharmacist survey, and secondary Medicaid, Medicare and demonstration DUR program data. In addition, this Annual Report will discuss findings from the first round of site visits to Iowa, and the first year of claims and eligibility data from Iowa and the two non-demonstration States.

The 1997 Annual Report will present findings from the pharmacy/pharmacist survey, administered in Iowa and the two non-demonstration States one year earlier, as well as analyses based on two full years of claims and eligibility data from Iowa and the non-demonstration States.

Each Annual Report will also include background information based on the most recent review of annual state Medicaid DUR reports.

The Final Report of the evaluation will complete the analysis of Iowa data, and provide a summary analysis of both demonstrations and of Medicaid RDUR programs in these States. The Final Report will also present estimates of the likely cost-savings and cost-effectiveness of alternative DUR interventions for the State and Federal Governments.

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- A-2 Total Number of Medicaid Recipients by Eligibility Category by Age
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- A-4 Percentage of Screener Drug Expenditures by Eligibility Category by Age
- A-5 Percentage of Screener Drug Prescription Volume(a) by Eligibility Category by Age
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- A-9 Screener Drug Expenditures(a) by Drug Class
- A-10 Screener Drug Prescription Volume(a) by Drug Class
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Table A-1
Iowa
Total Medicaid Expenditures
By Eligibility Category

	1989	1990	1991	1992	1993	Percentage Change From 1989 to 1993
Total Expenditures	540,166,198	651,703,721	765,105,163	831,407,265	876,561,284	62.28
Children	128,394,575	155,702,206	184,494,706	204,987,706	216,782,654	68.84
Non-disabled Adults	89,730,862	113,289,267	123,284,115	127,929,155	131,219,779	46.24
Aged	155,615,154	189,640,224	225,865,408	243,981,701	261,511,292	68.05
Disabled Adults	166,425,607	193,072,024	231,460,934	254,508,703	267,047,559	60.46
Total Pharmacy(a) Expend.	48,032,684	58,955,796	70,383,836	81,762,472	85,062,481	77.09
Children	6,707,634	8,212,832	10,394,879	12,256,904	13,815,807	105.97
Non-disabled Adults	8,042,702	9,992,284	11,131,223	12,199,941	12,920,851	60.65
Aged	20,991,520	25,485,514	29,889,193	33,160,225	32,828,384	56.39
Disabled Adults	12,290,828	15,265,166	18,968,541	24,145,402	25,497,439	107.45
Total Institutional(b) Expend.	400,294,909	482,952,297	570,530,442	616,322,958	645,979,491	61.38
Children	84,869,800	104,437,890	124,514,426	139,957,217	141,518,844	66.75
Non-disabled Adults	48,971,156	63,221,909	69,793,450	72,120,069	73,954,448	51.02
Aged	129,989,697	158,592,793	189,329,587	203,701,426	221,023,021	70.03
Disabled Adults	136,464,256	156,699,705	186,892,979	200,544,246	209,483,178	53.51
Total Professional(c) Expend.	91,838,605	109,795,628	124,190,885	133,321,835	145,519,312	58.45
Children	36,817,141	43,051,484	49,585,401	52,773,585	61,448,003	66.90
Non-disabled Adults	32,717,004	40,075,074	42,359,442	43,609,145	44,344,480	35.54
Aged	4,633,937	5,561,917	6,646,628	7,120,050	7,659,887	65.30
Disabled Adults	17,670,523	21,107,153	25,599,414	29,819,055	32,066,942	81.47

a • Includes both prescription and over-the-counter drugs

b • Institutional Services include inpatient hospital, outpatient hospital, nursing home, and congregate care bills

c • Professional Services include services provided by medical practitioners, medical equipment suppliers, and medically necessary transportation

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files

Table A-2
Iowa
Total Number of Medicaid Recipients
By Eligibility Category by Age

	1989	1990	1991	1992	1993	Percentage Change From 1989 to 1993
All Medicaid Recipients	224,207	249,758	270,808	283,208	293,870	31.07
Children	110,516	124,497	137,772	145,384	151,875	37.42
0-6	53,642	62,924	71,000	76,180	79,393	48.01
7-13	33,502	36,116	39,618	41,336	43,397	29.54
14-19	23,372	25,457	27,154	27,868	29,085	24.44
Non-disabled Adults	56,371	64,419	67,145	68,072	71,357	26.58
20-29	29,830	33,719	35,820	36,482	37,531	25.82
30-39	17,886	20,303	21,760	22,310	23,681	32.40
40-49	5,557	6,500	6,480	6,580	7,184	29.28
50-59	2,023	2,628	2,129	1,892	2,116	4.60
60-64	1,075	1,269	956	808	845	-21.40
Aged	34,348	37,402	38,910	39,723	40,005	16.47
65-69	4,885	5,028	5,316	5,376	5,350	9.52
70-74	5,234	5,671	5,926	6,111	6,099	16.53
75-79	6,144	6,533	6,591	6,537	6,516	6.05
80-84	6,345	6,947	7,200	7,335	7,231	13.96
85+	11,740	13,223	13,877	14,364	14,809	26.14
Disabled Adults	22,972	23,440	26,981	30,029	30,633	33.35
20-29	5,436	5,305	5,591	5,969	5,847	7.56
30-39	5,656	5,825	6,719	7,547	7,692	36.00
40-49	4,425	4,642	5,572	6,484	6,873	55.32
50-59	4,780	4,835	5,755	6,439	6,708	40.33
60-64	2,675	2,833	3,344	3,590	3,513	31.33

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files

Table A-3
Iowa
Summary Pharmacy Expenditure and Volume(a) Statistics

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)		
Total Pharmacy Expenditures(c)	48,033	12,913	58,956	15,864	70,384	18,835	81,762	21,544	85,062	22,854	77.09	76.99
% Screener Drug Expenditures	30.86	31.03	30.78	30.98	30.57	30.72	29.73	30.17	25.90	26.07	-16.06	-15.97
Total Pharmacy Volume	2,939,757	799,674	3,238,660	880,198	3,525,348	946,804	3,728,637	994,354	3,906,867	1,059,591	32.90	32.50
% Screener Drug Rx Volume	21.98	21.71	21.93	21.58	21.81	21.48	22.06	21.71	21.32	20.89	-3.03	-3.79
Total Number of Drug Recipients	178,823	65,561	198,152	73,177	214,550	80,443	220,090	83,827	231,860	93,334	29.66	42.36
% of Drug Recipients using 1 or more Screener Drugs	36.92	30.96	37.05	30.84	37.41	31.05	38.75	31.95	38.69	31.89	4.79	2.99
Pharmacy Expend. per Medicaid Recipient	0.21	0.06	0.24	0.06	0.26	0.07	0.29	0.08	0.29	0.08	35.11	35.04
Pharmacy Expend. per Drug Recipient	268.60	196.95	297.53	216.79	328.05	234.14	371.50	257.00	366.87	244.86	36.58	24.33
Scren. Drug Expend. per Screener Drug Recipient	224.51	197.36	247.23	217.77	268.04	231.70	284.95	242.65	245.63	200.20	9.41	1.44
Pharmacy Volume per Drug Recipient	16.44	12.20	16.34	12.03	16.43	11.77	16.94	11.86	16.85	11.35	2.50	-6.93
# of Scren. Drug Rxs per Screener Drug Recipient	9.79	8.55	9.67	8.42	9.58	8.14	9.65	8.06	9.28	7.44	1.32	2.53

a • Total number of pharmacy transactions

b • Includes both prescription and over-the-counter drugs

c • In thousands

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.



Table A-4
 Iowa
 Percentage of Screener Drug Expenditures
 By Eligibility Category by Age

		1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
		All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)
		Children		Non-disabled Adults		Aged		Disabled Adults					
Children	0-6	2.44	2.62	2.52	2.57	2.85	3.03	3.04	3.27	3.59	3.93	47.26	49.82
	7-13	0.23	0.25	0.23	0.26	0.32	0.36	0.37	0.41	0.57	0.65	145.31	154.74
	14-19	0.62	0.59	0.70	0.73	0.76	0.86	0.90	1.00	1.10	1.26	77.78	113.76
	20-29	1.59	1.78	1.59	1.59	1.78	1.80	1.77	1.86	1.92	2.03	21.10	13.83
Non-disabled Adults	30-39	15.24	15.66	16.13	16.95	15.29	16.79	14.70	16.19	14.53	16.85	-4.66	7.58
	40-49	3.04	3.21	3.29	3.62	3.16	3.47	3.11	3.58	2.77	3.52	-8.92	9.63
	50-59	5.55	5.84	5.90	6.53	5.88	6.67	5.69	6.45	5.67	6.65	2.30	13.87
	60-64	3.38	3.46	3.72	3.64	3.58	4.05	3.30	3.78	3.56	4.23	5.22	22.07
	65-69	1.78	1.67	1.90	1.76	1.63	1.56	1.52	1.48	1.59	1.66	-10.45	-0.10
	70-74	1.49	1.48	1.33	1.40	1.04	1.03	1.08	0.91	0.94	0.79	-37.29	-46.93
Aged	75-79	52.15	47.82	51.30	46.84	50.97	46.26	49.98	43.88	49.77	42.38	-4.56	-11.36
	80-84	7.55	7.59	7.29	7.18	7.31	7.25	6.91	6.91	6.80	6.85	-9.96	-9.75
	85+	8.39	7.57	8.29	7.66	8.15	7.85	8.13	7.96	7.92	7.57	-5.64	-0.02
	60-64	10.14	8.99	9.78	8.90	9.47	8.58	8.72	7.71	8.84	7.83	-12.84	-12.93
	65-69	10.08	9.42	9.93	9.04	9.95	8.86	9.89	8.36	9.61	7.51	-4.61	-20.34
	70-74	15.99	14.25	16.01	14.06	16.09	13.71	16.33	12.94	16.61	12.63	3.85	-11.32
Disabled Adults	20-29	30.18	33.90	30.05	33.64	30.88	33.93	32.29	36.66	32.11	36.83	6.41	8.67
	30-39	3.02	3.50	2.96	3.41	2.80	3.34	2.81	3.37	2.68	3.40	-11.23	-3.02
	40-49	6.43	8.15	6.10	7.81	6.21	7.92	6.56	8.36	6.35	7.89	-1.24	-3.10
	50-59	7.17	8.35	7.18	8.23	7.56	8.39	8.28	9.70	8.47	10.04	18.15	20.25
	60-64	8.43	8.90	8.79	9.46	9.14	9.41	9.50	10.23	9.70	10.46	14.97	17.61
	65-69	5.13	5.00	5.03	4.73	5.17	4.86	5.14	5.01	4.92	5.04	-4.12	0.83

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.

Table A-5
 Iowa
 Percentage of Screener Drug Prescription Volume(a)
 By Eligibility Category by Age

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)
Children	3.75	4.10	4.14	4.35	4.86	5.33	5.63	6.25	6.54	7.38	74.33	79.81
0-6	0.38	0.42	0.44	0.48	0.73	0.80	0.91	0.95	1.34	1.53	255.94	266.28
7-13	1.17	1.21	1.41	1.50	1.65	1.90	2.04	2.38	2.45	2.89	109.04	138.31
14-19	2.20	2.47	2.30	2.37	2.48	2.63	2.68	2.91	2.75	2.96	24.77	19.66
Non-disabled Adults	14.93	15.56	15.58	16.58	14.84	16.39	14.36	16.16	14.88	17.48	-0.31	12.38
20-29	3.82	4.04	3.98	4.28	3.85	4.30	3.79	4.35	3.69	4.64	-3.19	14.69
30-39	5.53	5.98	5.73	6.35	5.72	6.43	5.58	6.55	5.85	6.94	5.76	15.92
40-49	2.86	2.88	3.13	3.24	3.01	3.41	2.82	3.20	3.13	3.81	9.57	32.16
50-59	1.48	1.43	1.63	1.62	1.38	1.40	1.25	1.29	1.37	1.43	-7.49	-0.29
60-64	1.24	1.21	1.10	1.10	0.88	0.85	0.93	0.76	0.83	0.67	-32.76	-44.70
Aged	54.04	49.50	52.89	48.20	51.87	46.56	50.28	43.31	48.92	40.51	-9.47	-18.17
65-69	6.75	6.75	6.52	6.46	6.50	6.42	6.19	5.91	6.05	5.80	-10.46	-14.02
70-74	7.79	7.24	7.82	7.41	7.63	7.32	7.47	7.27	7.17	6.84	-7.98	-5.51
75-79	9.81	8.76	9.48	8.59	9.16	8.58	8.57	7.71	8.32	7.16	-15.22	-18.30
80-84	10.54	9.61	10.34	9.34	10.17	8.97	9.95	8.33	9.56	7.37	-9.29	-23.35
85+	19.14	17.13	18.73	16.39	18.42	15.27	18.10	14.10	17.83	13.33	-6.89	-22.19
Disabled Adults	27.29	30.84	27.40	30.88	28.42	31.71	29.72	34.28	29.66	34.63	8.71	12.30
20-29	3.13	3.72	3.08	3.69	2.91	3.47	2.97	3.63	2.80	3.63	-10.67	-2.38
30-39	6.05	7.60	5.85	7.48	6.11	7.89	6.47	8.22	6.33	8.18	4.60	7.50
40-49	6.32	7.37	6.44	7.53	6.86	7.79	7.49	8.73	7.68	8.95	21.66	21.52
50-59	7.36	7.67	7.61	7.98	7.97	8.26	8.29	9.13	8.56	9.36	16.34	22.01
60-64	4.43	4.47	4.42	4.20	4.57	4.31	4.50	4.58	4.29	4.51	-3.10	0.83

a • Total number of prescription fill events
 Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.

Table A-6
Iowa
Percentage of Drug Using Recipients Using 1 or More Screener Drugs
By Eligibility Category by Age

	1989			1990			1991			1992			1993			Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	
Children(a)																	
0-6	1.80	1.29	3.18	2.42	5.89	4.54	7.16	5.48	10.30	7.64	470.81	493.52					
7-13	8.24	6.93	9.73	8.31	11.15	10.11	13.07	12.38	14.86	13.79	80.41	98.84					
14-19	27.52	23.33	28.67	23.30	30.05	25.26	32.45	27.63	31.56	27.29	14.66	16.96					
Non-disabled Adults(a)																	
20-29	36.13	28.58	36.61	28.48	36.46	29.33	37.77	30.41	37.08	31.24	2.63	9.31					
30-39	50.02	42.20	50.49	43.26	50.95	43.25	51.84	44.76	50.61	43.85	1.18	3.91					
40-49	60.70	53.08	61.31	53.86	61.71	52.88	62.96	56.27	61.83	55.45	1.87	4.46					
50-59	67.25	60.31	68.79	62.55	68.57	61.13	68.04	62.01	69.75	62.02	3.72	2.84					
60-64	75.74	68.55	71.75	66.36	72.80	64.85	77.42	70.85	75.54	65.92	-0.27	-3.84					
Aged(a)																	
65-69	75.01	70.42	75.64	68.90	76.57	70.04	76.97	69.51	75.78	69.03	1.03	-1.97					
70-74	77.02	71.24	77.33	72.78	78.54	73.44	78.76	74.37	77.43	72.18	0.53	1.33					
75-79	78.01	75.74	78.50	75.14	78.70	73.87	78.60	72.30	79.60	75.59	2.04	-0.21					
80-84	78.16	73.79	77.87	73.93	78.28	72.31	79.00	74.83	78.43	72.35	0.35	-1.95					
85+	76.06	72.27	74.80	71.24	74.27	69.51	74.81	70.32	74.13	66.78	-2.54	-7.60					
Disabled Adults(a)																	
20-29	50.81	44.72	50.62	45.41	51.94	46.18	53.75	48.45	53.10	48.32	4.50	8.05					
30-39	66.14	61.89	64.96	60.21	66.12	62.61	66.80	60.92	67.15	60.92	1.54	-1.56					
40-49	72.77	67.39	73.38	66.73	72.58	64.99	74.87	66.61	74.30	67.44	2.10	0.07					
50-59	77.08	68.03	78.30	70.82	78.86	72.26	79.47	70.67	79.13	71.37	2.66	4.91					
60-64	78.35	69.74	78.22	68.22	78.28	69.05	79.41	70.80	78.89	70.22	0.69	0.68					

a • Weighted average over all sub-groups

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.

Table A-7
Iowa
Screener Drug Expenditures per Screener Drug Recipient
By Eligibility Category by Age

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)
Children(a)	50.00	48.40	50.05	45.97	50.96	45.48	53.19	46.00	45.66	39.14	-8.67	-19.14
0-6	46.49	48.82	26.87	27.47	21.30	20.93	22.01	20.44	19.70	18.62	-57.63	-61.86
7-13	47.54	40.91	52.37	47.90	53.35	49.20	62.35	52.07	54.24	45.13	14.09	10.33
14-19	51.47	51.01	55.65	50.07	65.91	56.44	68.58	58.01	65.08	53.03	26.44	3.96
Non-disabled Adults(a)	108.31	92.95	121.72	107.25	136.34	121.87	143.91	122.79	124.96	105.59	15.36	13.61
20-29	51.27	45.54	60.14	56.48	65.27	58.70	69.04	62.44	55.69	50.92	8.61	11.81
30-39	111.86	96.26	128.84	114.34	142.41	127.21	151.58	129.02	131.68	110.22	17.71	14.49
40-49	183.62	154.85	213.92	172.22	242.07	226.12	247.30	216.18	222.84	190.41	21.36	22.96
50-59	235.17	190.21	239.95	198.61	294.52	245.03	348.11	277.38	294.40	256.32	25.18	34.76
60-64	322.08	305.84	325.93	319.45	385.87	386.39	473.71	373.77	392.86	318.60	21.98	4.17
Aged(a)	312.27	281.94	348.63	319.11	394.26	358.09	430.32	396.86	391.02	346.39	25.22	22.86
65-69	339.82	299.83	389.25	340.42	433.59	388.55	465.03	434.21	423.91	377.53	24.74	25.91
70-74	336.62	300.88	376.67	335.03	417.39	375.11	461.61	418.50	418.78	366.66	24.40	21.86
75-79	335.35	289.02	372.53	334.79	420.19	366.76	448.66	402.47	413.29	361.25	23.24	24.99
80-84	317.54	302.72	353.01	336.96	403.99	382.21	444.76	414.22	402.13	341.94	26.64	12.95
85+	275.31	249.13	307.12	282.48	350.80	316.65	387.89	355.38	352.02	315.77	27.86	26.75
Disabled Adults(a)	331.37	291.50	378.38	325.62	411.58	348.96	430.57	375.25	389.57	325.10	17.56	11.53
20-29	202.00	179.05	244.10	206.41	255.37	224.00	260.18	227.01	228.23	192.65	12.98	7.59
30-39	308.76	273.14	346.81	309.32	357.40	314.87	372.74	333.43	317.55	266.82	2.85	-2.31
40-49	379.00	335.03	430.04	367.40	458.65	390.36	480.30	423.46	419.64	359.58	10.72	7.33
50-59	376.63	335.63	454.98	400.94	481.96	412.32	502.70	441.40	450.04	380.63	19.49	13.41
60-64	397.75	349.03	443.25	377.40	469.70	394.13	492.78	431.66	441.80	386.20	11.07	10.65

a • Weighted average over all sub-groups

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.

Table A-8
Iowa
Number of Screener Drug Prescriptions per Screener Drug Recipient
By Eligibility Category by Age

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)
Children(a)	3.35	3.27	3.22	3.00	3.10	2.81	3.33	2.92	3.14	2.73	-6.20	-16.71
0-6	3.30	3.49	2.04	2.00	1.75	1.63	1.82	1.58	1.76	1.64	-46.70	-52.99
7-13	3.93	3.66	4.11	3.80	4.16	3.80	4.81	4.12	4.57	3.86	16.31	5.42
14-19	3.11	3.07	3.14	2.89	3.29	2.90	3.50	3.02	3.51	2.88	12.93	-6.33
Non-disabled Adults(a)	4.64	4.01	4.62	4.06	4.73	4.17	4.76	4.07	4.84	4.06	4.19	1.22
20-29	2.81	2.49	2.85	2.58	2.84	2.55	2.84	2.52	2.81	2.49	0.08	0.25
30-39	4.87	4.27	4.90	4.30	4.95	4.31	5.04	4.35	5.13	4.27	5.50	-0.10
40-49	6.77	5.58	7.06	5.92	7.28	6.69	7.13	6.09	7.41	6.37	9.56	14.10
50-59	8.54	7.09	8.06	7.05	8.90	7.75	9.73	8.06	9.58	8.18	12.11	15.28
60-64	11.64	10.87	10.60	9.69	11.76	11.21	13.82	10.44	13.20	10.11	13.38	-6.97
Aged(a)	14.11	12.66	14.06	12.69	14.34	12.66	14.66	13.01	14.53	12.30	2.97	-2.81
65-69	13.26	11.56	13.61	11.83	13.78	12.09	14.09	12.34	14.26	11.89	7.55	2.81
70-74	13.63	12.47	13.92	12.53	13.96	12.29	14.37	12.69	14.33	12.31	5.18	-1.28
75-79	14.14	12.21	14.12	12.50	14.52	12.89	14.93	13.36	14.70	12.28	3.93	0.52
80-84	14.47	13.39	14.38	13.46	14.75	13.59	15.15	13.71	15.11	12.47	4.40	-6.84
85+	14.37	12.99	14.06	12.73	14.35	12.40	14.56	12.86	14.28	12.38	-0.61	-4.67
Disabled Adults(a)	13.06	11.49	13.50	11.57	13.54	11.49	13.41	11.66	13.58	11.35	4.03	-1.21
20-29	9.13	8.24	9.94	8.64	9.50	8.16	9.30	8.11	9.00	7.65	-1.43	-7.17
30-39	12.66	11.05	13.02	11.45	12.56	11.02	12.46	10.89	11.96	10.26	-5.57	-7.11
40-49	14.56	12.82	15.11	12.99	14.86	12.74	14.71	12.67	14.39	11.92	-1.16	-7.03
50-59	14.32	12.54	15.41	13.06	15.02	12.72	14.85	13.09	15.02	12.65	4.83	0.85
60-64	14.99	13.52	15.24	12.96	14.84	12.27	14.60	13.10	14.59	12.82	-2.68	-5.17

a • Weighted average over all sub-groups

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.

Table A-9
Iowa
Screener Drug Expenditures(a) by Drug Class

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)
All Screener Drugs												
Core(b)	14,823	4,006	18,149	4,915	21,513	5,787	24,304	6,499	22,033	5,959	48.65	48.73
Peripheral(c)	6,903	2,520	8,305	3,018	9,766	3,524	10,837	3,792	10,474	3,740	51.74	48.43
ACE Inhibitors												
Core(b)	1,054	263	1,400	357	1,760	446	2,128	552	2,454	627	132.83	138.09
Peripheral(c)	1,964	508	2,312	592	2,557	663	2,637	674	2,508	633	27.70	24.51
Antidepressants												
Core(b)	1,783	508	2,554	730	3,058	878	3,658	1,050	3,736	1,078	109.58	112.20
Peripheral(c)	1,248	340	1,274	344	1,289	342	1,353	359	1,360	368	9.01	8.01
Antipsychotics												
Core(b)	1,763	543	1,806	553	1,833	543	1,879	557	1,789	524	1.43	-3.40
Peripheral(c)	1,044	291	1,145	317	1,260	327	1,436	348	1,491	339	42.86	16.45
Benzodiazepines												
Core(b)	1,242	365	1,404	416	1,673	490	1,858	550	1,440	426	15.94	16.71
Peripheral(c)	2,216	594	2,665	724	3,258	886	3,479	936	3,385	939	52.77	57.93
Calcium Channel Blockers												
Core(b)	2,119	517	2,896	708	3,657	917	4,269	1,071	4,208	1,116	98.63	115.91
Peripheral(c)	1,779	463	2,112	547	2,479	636	2,769	691	2,900	752	63.00	62.59
Digoxin												
Core(b)	399	94	483	112	576	130	593	130	586	126	46.79	33.88
Peripheral(c)	132	37	153	38	185	41	227	60	209	54	57.74	46.29
H12 Receptor Antagonists												
Core(b)	3,476	948	4,227	1,164	5,190	1,400	6,165	1,607	5,148	1,364	48.13	43.91
Peripheral(c)	2,256	614	2,885	787	3,483	941	3,945	1,039	3,592	953	59.24	55.16
NSAIDs												
Core(b)	2,987	768	3,379	874	3,766	983	3,754	983	2,672	697	-10.55	-9.29
Peripheral(c)	1,860	508	2,330	631	2,670	724	2,869	760	2,987	814	60.61	60.23

a • In thousands

b • Core screener drugs include those drugs which are members of the eight therapeutic categories considered by the screening criteria

c • Peripheral screener drugs include those drugs which affect the appropriateness of core drug use

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.

Table A-10
Iowa
Screening Drug Prescription Volume(a) by Drug Class

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)
All Screener Drugs												
Core(b)	646,230	173,640	710,230	189,955	768,782	203,405	822,696	215,901	832,784	221,358	28.87	27.48
Peripheral(c)	471,015	173,604	494,708	181,596	528,067	190,297	543,285	193,060	543,973	198,026	15.49	14.07
ACE Inhibitors												
Core(b)	33,408	8,446	42,454	10,590	49,772	12,387	57,645	14,664	65,352	16,338	95.62	93.44
Peripheral(c)	177,456	46,991	185,689	48,304	195,922	50,669	198,697	50,441	201,695	51,480	13.66	9.55
Antidepressants												
Core(b)	103,250	30,468	121,039	35,259	136,501	39,572	150,601	42,936	156,806	45,775	51.87	50.24
Peripheral(c)	101,226	28,766	104,028	29,626	104,656	29,051	111,447	30,840	121,416	34,534	19.95	20.05
Antipsychotics												
Core(b)	113,462	31,319	114,607	30,856	111,286	29,813	111,235	29,686	110,093	29,902	-2.97	-4.52
Peripheral(c)	68,909	19,798	72,367	20,768	75,143	20,775	78,732	21,389	80,646	21,927	17.03	10.75
Benzodiazepines												
Core(b)	78,710	22,742	80,384	23,186	85,439	23,738	91,831	25,794	93,753	25,657	19.11	12.82
Peripheral(c)	198,212	52,597	203,915	55,789	224,396	60,733	221,949	60,789	228,197	64,485	15.13	22.60
Calcium Channel Blockers												
Core(b)	55,835	13,549	71,146	17,323	86,210	21,327	97,536	24,063	100,334	25,755	79.70	90.09
Peripheral(c)	126,855	31,900	134,224	33,568	141,124	34,658	146,655	34,990	147,964	35,505	16.64	11.30
Digoxin												
Core(b)	72,449	16,915	74,728	17,459	77,206	17,495	78,695	17,125	76,807	16,293	6.02	-3.68
Peripheral(c)	5,066	1,290	5,154	1,203	5,518	1,139	5,881	1,325	5,592	1,288	10.38	-0.16
H2 Receptor Antagonists												
Core(b)	70,130	18,688	80,788	21,772	90,943	24,018	101,730	25,968	100,009	25,976	42.61	39.00
Peripheral(c)	125,083	34,783	135,900	37,101	140,528	37,478	145,494	37,732	141,997	37,158	13.52	6.83
NSAIDs												
Core(b)	118,986	31,513	125,084	33,510	131,425	35,055	133,423	35,665	129,630	35,662	8.95	13.17
Peripheral(c)	124,929	33,759	134,215	35,818	141,962	37,679	146,679	38,262	152,291	40,820	21.90	20.92

a • Total number of prescription fill events

b • Core screener drugs include those drugs which are members of the eight therapeutic categories considered by the screening criteria

c • Peripheral screener drugs include those drugs which affect the appropriateness of core drug use

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.

Table A-11
 Iowa
 Percentage of Screener Drug Expenditures
 By Drug Class(a)

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)		
ACE Inhibitors	7.11	6.57	7.71	7.27	8.18	7.71	8.75	8.49	11.14	10.52	56.64	60.08
Antidepressants	12.03	12.68	14.07	14.86	14.22	15.18	15.05	16.16	16.96	18.09	40.99	42.67
Antipsychotics	11.90	13.55	9.95	11.25	8.52	9.38	7.73	8.57	8.12	8.80	-31.76	-35.05
Benzodiazepines	8.38	9.12	7.74	8.47	7.77	8.46	7.65	8.46	6.54	7.15	-22.00	-21.53
Calcium Channel Blockers	14.29	12.91	15.96	14.41	17.00	15.85	17.56	16.47	19.10	18.74	33.63	45.17
Digoxin	2.69	2.34	2.66	2.27	2.68	2.25	2.44	2.00	2.66	2.11	-1.25	-9.98
H2 Receptor Antagonists	23.45	23.66	23.29	23.69	24.12	24.18	25.37	24.72	23.37	22.89	-0.35	-3.24
NSAIDs	20.15	19.17	18.62	17.79	17.51	16.99	15.45	15.13	12.13	11.69	-39.82	-39.01

a • Core screener drugs only

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.

Table A-12
Iowa
Percentage of Screener Drug Prescription Volume(a)
By Drug Class(b)

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)	All Pharmacies (n=1,549)	Demonstration Pharmacies (n=223)		
ACE Inhibitors	5.17	4.86	5.98	5.58	6.47	6.09	7.01	6.79	7.85	7.38	51.80	51.74
Antidepressants	15.98	17.55	17.04	18.56	17.76	19.45	18.31	19.89	18.83	20.68	17.85	17.85
Antipsychotics	17.56	18.04	16.14	16.24	14.48	14.66	13.52	13.75	13.22	13.51	-24.71	-25.11
Benzodiazepines	12.18	13.10	11.32	12.21	11.11	11.67	11.16	11.95	11.26	11.59	-7.57	-11.50
Calcium Channel Blockers	8.64	7.80	10.02	9.12	11.21	10.48	11.86	11.15	12.05	11.63	39.44	49.11
Digoxin	11.21	9.74	10.52	9.19	10.04	8.60	9.57	7.93	9.22	7.36	-17.73	-24.44
H2 Receptor Antagonists	10.85	10.76	11.37	11.46	11.83	11.81	12.37	12.03	12.01	11.73	10.66	9.03
NSAIDs	18.41	18.15	17.61	17.64	17.10	17.23	16.22	16.52	15.57	16.11	-15.46	-11.23

a • Total number of prescription fill events

b • Core screener drugs only

Source: Iowa Medicaid Claims, Iowa Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Iowa Medicaid recipients.

Table A-13 Core Drugs by Therapeutic Class

Table A-13 Core Drugs by Therapeutic Class	
Therapeutic Class	Core Drugs Generic (Brand Name)
ACE Inhibitors	Benazapril (Lotensin[®]) Captopril (Capoten[®]) Captopril/HCTZ (Capozide[®]) Enalapril (Vasotec[®]) Enalapril/HCTZ (Vaseretic[®]) Fosinopril (Monopril[®]) Lisinopril (Prinivil[®], Zestril[®]) Lisinopril/HCTZ (Prinzide[®], Zestoretic[®]) Quinapril (Accupril[®]) Ramipril (Altace[®])
Antidepressants	Amitriptyline (Elavil[®], Endep[®]) Amitriptyline/Chlordiazepoxide (Limbitrol[®]) Amoxapine (Ascendin[®]) Bupropion (Wellbutrin[®]) Clomipramine (Anafranil[®]) Desipramine (Norpramin[®], Pertofrane[®]) Doxepin (Adapin[®], Sinequan[®], Triadapin[®]) Fluoxetine (Prozac[®]) Imipramine (Impril[®], Janimine[®], Tofranil[®]) Maprotiline (Ludionil[®]) Nortriptyline (Aventyl[®], Pamelor[®]) Paroxetine (Paxil[®]) Protriptyline (Vivactil[®]) Sertraline (Zoloft[®]) Trazodone (Desyrel[®]) Trimipramine (Surmontil[®]) Venlafaxine (Effexor[®])

Table A-13 Core Drugs by Therapeutic Class

Therapeutic Class	Core Drugs Generic (Brand Name)
Antipsychotics	Acetophenazine (Tindal [®]) Chlorpromazine (Thorazine [®]) Chlorprothixene (Taractan [®]) Clozapine (Clozaril [®]) Fluphenazine (Prolixin [®] , Permitil [®]) Haloperidol (Haldol [®]) Loxapine (Loxitane [®]) Mesoridazine (Serentil [®]) Molindone (Mobar [®]) Perphenazine (Trilafon [®]) Perphenazine/Amitriptyline (Triavil [®] , Etrafon [®]) Pimozide (Orap [®]) Prochlorperazine (Compazine [®]) Promazine (Sparine [®]) Risperidone (Risperdal [®]) Thioridazine (Mellaril [®]) Thiothixene (Navane [®]) Trifluoperazine (Stelazine [®])
Benzodiazepines	Alprazolam (Xanax) [®] Chlordiazepoxide* (Libritabs, [®] Limbitrol [®] , Librium [®]) Clorazepate (Gene-Xene [®] , Novoclopat [®] , Traxene [®]) Diazepam (Valium [®]) Estazolam (ProSom [®]) Flurazepam (Dalmane [®] , Durapam [®] , Som-Pam [®]) Halazepam (Paxipam [®]) Lorazepam (Ativan [®]) Oxazepam (Novoxapam [®] , Ox-Pam [®] , Serax [®] , Zapex [®]) Prazepam (Centrax [®]) Quazepam (Dural [®]) Temazepam (Razepam [®] , Restoril [®] , Temaz [®]) Triazolam (Halcion [®])

Table A-13 Core Drugs by Therapeutic Class

Table A-13 Core Drugs by Therapeutic Class	
Therapeutic Class	Core Drugs Generic (Brand Name)
Calcium Channel Blockers	Amlodipine (Norvasc [®]) Bepridil (Vasacor [®]) Diltiazem (Cardizem [®] , Cardizem CD [®] , Cardizem SR [®] , Dilacor XR [®]) Felodipine (Plendil [®]) Isradipine (DynaCirc [®]) Nifedipine (Cardene [®] , Cardene SR [®]) Nifedipine (Procardia [®] , Procardia XL [®] , Adalat CC [®]) Nimodipine (Nimotop [®]) Verapamil (Calan [®] , Isoptin [®] , Calan SR [®] , Isoptin SR [®] , Veralen [®])
Digoxin	Digoxin (Lanoxin [®]) Digitoxin (Crystodigin [®])
H ₂ -Blockers	Cimetidine (Tagamet [®]) Famotidine (Pepcid [®]) Nizatidine (Axid [®]) Ranitidine (Zantac [®])



Table A-13 Core Drugs by Therapeutic Class

Table A-13 Core Drugs by Therapeutic Class	
Therapeutic Class	Core Drugs Generic (Brand Name)
Non-steroidal anti-inflammatory drugs	Choline Mg Trisalicylate Diclofenac (Voltaren[®]) Diclofenac Potassium (Cataflam[®]) Diflusal (Dolobid[®]) Etodolac (Lodine[®]) Extended Release Aspirin (ZorPrin[®], EasPRIN[®]) Fenoprofen (Fenoprofen[®], Nalfon[®], Progesic[®]) Fluriprofen (Ansaide[®]) Ibuprofen (Advil[®], Motrin[®], Nuprin[®]) Indomethacin (Imbrilol[®], Indocin[®]) Ketoprofen (Orudis[®]) Magnesium Salicylate (Magan[®], Magsal[®]) Meclofenamate (Meclofen[®], Meclomen[®]) Mefenamic Acid (Ponstel[®]) Nabumetone (Relafen[®]) Naproxen (Naprosyn[®]) Naproxen Sodium (Anaprox[®]) Oxaprozin (Daypro[®]) Phenylbutazone (Butazolidin[®], Intrabutazone[®]) Piroxicam (Feldene[®]) Salsalate (Disalcid[®], Mono-Gesic[®], Salflex[®]) Sulindac (Clinoril[®]) Tolmentin (Tolectin[®])

**Table A-14
Therapeutic Class of Screener Drugs and the Peripheral Drugs Associated with those Screens**

Therapeutic Class of Screen Drug	Peripheral Drugs * Generic (Brand Name)
ACE Inhibitor	Lithium Lithium (Eskalith[®], Lithonate[®], Lithane[®], Lithobid[®], Lithotabs[®], Cibalth-S[®]) Potassium Supplements (Numerous) Potassium Sparing Diuretics Amiloride (Midamor[®]) Amloride/HCTZ (Moduretic[®]) Spironolactone (Aldactone[®]) Spironolactone/HCTZ (Spiroazide[®], Spirozide[®], Aldactazide[®]) Triamterene (Dyrenium[®]) Triamterene/HCTZ (Dyazide[®])

**Table A-14
Therapeutic Class of Screener Drugs and the Peripheral Drugs Associated with those Screens.**

Therapeutic Class of Screen Drug	Peripheral Drugs* Generic (Brand Name)
Antidepressants	Antimuscarinics and Antispasmodics Anistropine (Valpin[®]) Atropine (Antrocol[®]) Belladonna (Donnatal[®], Antispasmodic[®], Halponal[®]) Clidinium (Quarzan[®], CDP Plus[®], Clindex[®]) Dicyclomine (Benty[®]) Hexocyclium (Tral Filmtabs[®]) Hyoscymaine (Cytospaz[®], Levsinex[®], Levsin[®], Anaspaz[®]) Isopropamide (Darabid[®]) Mepenzolate (Cantil[®]) Methscoploamine (Pamine[®]) Oxyphenyclimine (Daricon[®]) Propantheline (Pro-Banthine[®]) Scopolamine (Transderm Scop[®]) Tridihexethyl (Pathilon[®]) Antiparkinsonian Benztropine (Cogentin[®]) Biperiden (Akineton[®]) Ethiopropazine (Parsidol[®]) Procyclidine (Kemadrin[®]) Trihexyphenidyl (Artane[®], Trihexane[®]) Monoamine Oxidase Inhibitors Isocarboxazid (Marplan[®]) Phenelzine (Nardil[®]) Tranylcypromine (Parnate[®]) Stimulants Amphetamine (Biphetamine[®]) Benzamphetamine (Didrex[®]) Dextroamphetamine (Biphetamine[®], Dexedrine[®]) Methamphetamine (Desoxyn[®]) Methylphenadate (Ritalin[®]) Phendimetrazine (Phenazine[®], Adipost[®], Adphen[®])

**Table A-14
Therapeutic Class of Screener Drugs and the Peripheral Drugs Associated with those Screens**

Therapeutic Class of Screen Drug	Peripheral Drugs * Generic (Brand Name)
Antipsychotics	Antimuscarinics and Antispasmodics (see list above) Antiparkinsonian (see list above) Miscellaneous Medications Levadopa (Dopa ^r , Lardopa ^r , Sinemet [®])



Table A-14
Therapeutic Class of Screener Drugs and the Peripheral Drugs Associated with those Screens

Therapeutic Class of Screen Drug	Peripheral Drugs * Generic (Brand Name)
Benzodiazepines	Antihistamines Antazoline (Antizoline-V[®]) Azatadine (Optimine[®], Trinalin Repetabs[®]) Bromodiphenhydramine (Ambenyl[®]) Brompheniramine (Dimetane[®], Brotane[®], Allent[®]) Bucizine (Bucladin-S Softabs[®]) Carbinoxamine (Carbodec[®], Rondec[®]) Chlorpheniramine (Teldrin[®], Chlor-Trimeton[®], Codimal[®]) Clemastine (Tavist[®]) Cyclizine (Marezine[®]) Cyproheptadine (Periactin[®]) Dexbrompheniramine (Drixoral[®], Disobrom[®], Disophrol[®]) Dimenhydrate (Dramamine[®]) Diphenhydramine (Benadryl[®]) Diphenylpyraline (Hispril[®], Novahistine DH [®]) Doxylamine (NyQuil[®], Pertussin PM[®]) Hydroxyzine (Anxanil[®], Atarax[®], Vistaril[®]) Methdilazine (Tacaryl[®]) Phenindamine (Nolahist[®], P-V-Tussin[®]) Peniramine (Robitussin AC[®]) Phenyltoloxamine (Norel Plus[®]) Pyrilamine (Chexit[®], Tussagesic[®]) Terfenadine (Seldane[®], Seldane D[®]) Trimeprazine (Temaril[®]) Tripeleennamine (PBZ[®], PBZ-R[®]) Triprolidine (Actidil[®], Actifed[®]) Anxiolytics Buspirone (BuSpar[®]) Diphenhydramine (Benadryl[®], Beix[®]) Hydroxyzine (Atarax[®], Vistaril[®]) Meprobamate (Equanil[®], Miltown[®], Equagesic[®]) Sedative/Hypnotics



Table A-14
Therapeutic Class of Screener Drugs and the Peripheral Drugs Associated with those Screens

Therapeutic Class of Screen Drug	Peripheral Drugs * Generic (Brand Name)
Calcium Channel Blockers	Beta-Blockers Acebutolol (Monitan[®], Sectra[®]) Atenolol (Tenormin[®]) Atenolol/Chlorthalidone (Tenoretic[®]) Betaxolol (Betoptic[®], Betoptic S[®]) Caretolol (Cartrol[®]) Labetolol (Normodyne[®], Trandate[®]) Labetolol/HCTZ (Normozine[®], Trandate HCT[®]) Metoprolol (Lopressor[®], Toprol XL[®]) Metoprolol/HCTZ (Lopressor HCT[®]) Nadolol (Corgard[®]) Nadolol/Bendroflumetaz (Corzide[®]) Penbutolol (Levator[®]) Pindolol (Visken[®]) Propranolol (Inderal[®], Vovopropanol[®]) Propranolol/HCTZ (Inderide[®], Inderide LA[®]) Timolol Maleate (Timoptic[®], Blocarden[®]) Timolol/HCTZ (Timolide[®]) Miscellaneous Medications Cyclosporine (Sandimmune[®]) Disopyramide (Rythmodan[®], Norpace[®]) Flecainide (Tambocor[®])
Digoxin	Miscellaneous Medications Amiodarone (Cordarone[®]) Propafenone (Rythmol[®]) Quinidine (Duraquin[®], Cardioquin[®])

Table A-14
Therapeutic Class of Screener Drugs and the Peripheral Drugs Associated with those Screens

Therapeutic Class of Screen Drug	Peripheral Drugs* Generic (Brand Name)
H ₂ -Blockers	Methylxanthines Aminophylline (Corophyllin[®], Palaron[®], Somophyllin[®]) Dyphylline (Diclor[®], Dyflex[®], Lufyllin[®], Thylline[®]) Oxtriphylline (Choledyl[®], Novotriphyll[®]) Theophylline (Quibron-T[®], Slo-bid[®], Somophyllin-12[®]) Miscellaneous Medications Ketoconazole (Nizoral[®]) Misoprostol (Cytotec[®]) Omeprazole (Losec[®]) Phenytoin (Dilantin[®]) Procainamide (Procan SR[®], Promine[®], Pronestyl[®]) Sucralfate (Carafate[®], Sulcrate[®]) Warfarin (Carfin[®], Coumadin[®], Marevan[®]) Pancreatic Enzymes Pancreatin (Creon[®], Donnazyme[®]) Pancrelipase (Cotazym[®], Ku-Zyme[®], Pancrease[®], Protilase[®])
Non-steroidal anti-inflammatory	Miscellaneous Drugs Mefenamic Acid (Ponstel[®]) Phenylbutazone (Butazolidan[®], Intrabutazone[®]) Methotrexate (Folex[®], Mexate[®]) Probenecid (Benemid[®], Bunuryl[®]) Warfarin (Carfin[®], Coumadin[®], Marevan[®]) Lithium (see above) Sulfonylureas Acetohexamide (Dimelor[®], Dymelor[®]) Chlorpropamide (Diabinese[®], Glucamide[®], Novopropamide[®]) Glipizide (Glucotrol[®]) Glyburide (DiaBeta[®], Micronase[®]) Tolazamide (Tolamide[®], Tolinase[®]) Tolbutamide (Mebenol[®], Orinase[®])

*Interact with Screener Drugs

List of Tables for Washington

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- B-9 Screener Drug Expenditures(a) by Drug Class
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- B-11 Percentage of Screener Drug Expenditures by Drug Class
- B-12 Percentage of Screener Drug Prescription Volume(a) by Drug Class(b)

Table B-1
Washington
Total Medicaid Expenditures
By Eligibility Category

	1989	1990	1991	1992	1993	Percentage Change From 1989 to 1993
Total Expenditures	827,389,057	992,212,541	1,225,188,698	1,470,989,862	1,621,639,759	95.99
Children	157,818,751	194,576,359	264,544,988	324,756,930	381,960,414	142.02
Non-disabled Adults	199,032,664	271,784,546	349,007,198	442,096,877	530,508,699	166.54
Aged	293,504,381	340,580,719	387,765,122	435,260,708	468,199,194	59.52
Disabled Adults	177,033,261	185,270,917	223,871,390	268,875,347	240,971,452	36.12
Total Pharmacy(a) Expend.	67,433,298	87,378,266	112,471,342	142,790,677	165,597,230	145.57
Children	8,677,714	11,307,571	15,104,499	19,386,971	23,694,768	173.05
Non-disabled Adults	16,067,329	24,663,111	32,913,311	45,929,547	61,660,989	283.77
Aged	23,111,268	28,793,902	34,724,703	40,774,440	44,664,895	93.26
Disabled Adults	19,576,987	22,613,682	29,728,829	36,699,719	35,576,578	81.73
Total Institutional(b) Expend.	544,065,928	626,966,329	728,500,454	856,538,450	910,751,700	67.40
Children	79,674,150	89,265,138	111,920,300	133,745,601	142,096,205	78.35
Non-disabled Adults	109,162,292	141,736,780	169,543,641	216,122,433	243,568,835	123.13
Aged	252,533,291	291,574,070	327,883,439	366,106,318	398,519,601	57.81
Disabled Adults	102,696,195	104,390,341	119,153,074	140,564,098	126,567,059	23.24
Total Professional(c) Expend.	215,889,831	277,867,946	384,216,902	471,660,735	545,290,829	152.58
Children	69,466,887	94,003,650	137,520,189	171,624,358	216,169,441	211.18
Non-disabled Adults	73,803,043	105,384,655	146,550,246	180,044,897	225,278,875	205.24
Aged	17,859,822	20,212,747	25,156,980	28,379,950	25,014,698	40.06
Disabled Adults	54,760,079	58,266,894	74,989,487	91,611,530	78,827,815	43.95

a • Includes both prescription and over-the-counter drugs

b • Institutional Services include inpatient hospital, outpatient hospital, nursing home, and congregate care bills

c • Professional Services include services provided by medical practitioners, medical equipment suppliers, and medically necessary transportation

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files

Table B-2
Washington
Total Number of Medicaid Recipients
By Eligibility Category by Age

	1989	1990	1991	1992	1993	Percentage Change From 1989 to 1993
All Medicaid Recipients	398,942	445,546	534,829	597,189	655,966	64.43
Children	189,922	217,745	272,590	309,906	346,213	82.29
0-6	98,281	115,361	143,381	164,138	182,510	85.70
7-13	56,097	62,857	80,736	91,503	101,659	81.22
14-19	35,544	39,527	48,473	54,265	62,044	74.56
Non-disabled Adults	125,287	143,647	168,102	187,294	214,786	71.44
20-29	61,031	68,778	79,616	85,884	92,736	51.95
30-39	43,156	48,827	57,607	64,158	73,205	69.63
40-49	15,173	17,714	20,985	24,584	30,868	103.44
50-59	5,176	6,802	7,997	9,875	13,509	160.99
60-64	751	1,526	1,897	2,793	4,468	494.94
Aged	45,911	47,803	51,053	53,713	55,239	20.32
65-69	8,273	8,664	9,561	10,284	10,711	29.47
70-74	7,844	8,423	9,255	9,904	10,325	31.63
75-79	8,303	8,523	9,004	9,284	9,366	12.80
80-84	7,877	8,269	8,679	9,168	9,360	18.83
85+	13,614	13,924	14,554	15,073	15,477	13.68
Disabled Adults	37,822	36,351	43,084	46,276	39,728	5.04
20-29	6,629	6,110	7,212	7,363	6,055	-8.66
30-39	9,027	8,687	10,451	11,423	9,831	8.91
40-49	7,511	7,377	9,409	10,721	9,561	27.29
50-59	8,186	7,807	9,241	10,017	8,847	8.07
60-64	6,469	6,370	6,771	6,752	5,434	-16.00

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files

Table B-3
Washington
Summary Pharmacy Expenditure and Volume(a) Statistics

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)
Total Pharmacy(b) Expenditures(c)	67,433	9,044	87,378	12,173	112,471	17,290	142,791	23,894	165,597	28,648	145.57	216.75
% Screener Drug Expenditures	30.85	29.89	31.02	31.05	30.36	30.89	28.90	29.46	26.69	27.82	-13.51	-6.93
Total Pharmacy Volume	4,276,950	562,165	5,369,831	735,153	5,879,684	895,752	6,477,924	1,066,566	7,602,761	1,220,450	77.76	117.10
% Screener Drug Rx Volume	19.66	18.40	19.83	18.99	19.81	19.14	19.35	18.92	19.15	18.16	-2.62	-1.32
Total Number of Drug Recipients	321,620	80,025	356,824	93,446	419,794	119,370	467,250	142,912	508,545	158,286	58.12	97.80
% of Drug Recipients using 1 or more Screener Drugs	34.35	25.14	34.33	25.34	33.94	25.43	34.87	26.20	34.08	26.02	-0.78	3.52
Pharmacy Expend. per Medicaid Recipient	0.17	0.02	0.20	0.03	0.21	0.03	0.24	0.04	0.25	0.04	49.35	92.64
Pharmacy Expend. per Drug Recipient	209.67	113.02	244.88	130.27	267.92	144.84	305.60	167.19	325.63	180.99	55.31	60.14
Scrn. Drug Expend. per Screener Drug Recipient	188.33	134.38	221.28	159.66	239.63	175.93	253.25	187.97	254.96	193.48	35.37	43.99
Pharmacy Volume per Drug Recipient	13.30	7.02	15.05	7.87	14.01	7.50	13.86	7.46	14.95	7.71	12.42	9.76
# of Scrn. Drug Rxs per Screener Drug Recipient	7.61	5.14	8.69	5.90	8.17	5.65	7.69	5.39	8.40	5.38	8.23	2.65

a • Total number of pharmacy transactions

b • Includes both prescription and over-the-counter drugs

c • In thousands

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients.

Table B-4
Washington
Percentage of Screener Drug Expenditures
By Eligibility Category by Age

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)
Children												
0-6	1.65	2.47	1.72	2.31	1.83	2.27	1.93	2.15	2.23	2.64	34.95	6.88
7-13	0.22	0.37	0.22	0.34	0.22	0.32	0.23	0.29	0.26	0.33	18.37	-12.48
14-19	0.42	0.70	0.44	0.69	0.49	0.57	0.54	0.60	0.69	0.81	62.84	15.12
	1.02	1.39	1.06	1.28	1.12	1.38	1.15	1.27	1.29	1.50	26.96	7.90
Non-disabled Adults												
20-29	23.52	27.79	29.70	33.88	31.23	35.88	34.31	39.96	40.85	46.64	73.67	67.80
30-39	4.09	5.23	4.47	5.78	4.52	5.67	4.67	5.98	4.91	6.16	19.92	17.67
40-49	8.31	10.20	9.90	11.88	10.16	12.00	10.43	12.46	11.53	13.43	38.70	31.75
50-59	6.38	7.47	8.10	8.93	8.53	9.82	9.53	11.16	11.35	12.97	78.01	73.58
60-64	4.20	4.27	5.87	5.85	6.39	6.61	7.37	7.75	9.53	10.11	126.91	136.64
	0.54	0.62	1.35	1.45	1.64	1.78	2.31	2.60	3.53	3.97	556.05	539.00
Aged												
65-69	40.28	30.56	38.57	28.33	37.18	26.04	35.40	24.79	34.67	24.64	-13.94	-19.39
70-74	8.36	7.93	8.10	7.19	7.83	6.90	7.43	6.71	7.44	7.40	-11.00	-6.75
75-79	7.53	7.11	7.34	6.69	7.34	6.15	7.08	6.06	6.95	5.75	-7.59	-19.13
80-84	7.70	5.97	7.22	5.48	6.84	5.05	6.50	4.52	6.17	4.38	-19.87	-26.73
85+	7.04	4.96	6.77	4.69	6.31	4.07	6.13	4.03	5.95	3.62	-15.37	-27.09
	9.67	4.59	9.12	4.27	8.85	3.87	8.26	3.46	8.15	3.50	-15.67	-23.75
Disabled Adults												
20-29	34.54	39.17	30.00	35.48	29.77	35.80	28.36	33.10	22.26	26.08	-35.57	-33.42
30-39	3.03	3.59	2.46	3.11	2.40	3.19	2.23	2.76	1.69	1.89	-44.17	-47.31
40-49	7.18	8.07	6.12	7.80	6.03	7.37	5.81	6.87	4.50	5.52	-37.31	-31.59
50-59	7.43	8.34	6.54	7.54	7.03	8.66	7.10	8.68	5.95	7.01	-19.97	-15.97
60-64	9.45	11.42	8.23	9.79	8.20	9.49	7.81	8.66	6.25	7.24	-33.82	-36.61
	7.46	7.74	6.66	7.25	6.11	7.10	5.39	6.13	3.87	4.41	-48.16	-42.98

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients



Table B-5
Washington
Percentage of Screener Drug Prescription Volume(a)
By Eligibility Category by Age

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)
Children	2.62	3.83	2.79	3.79	3.03	3.82	3.34	3.84	3.48	4.50	32.46	17.65
0-6	0.31	0.55	0.36	0.57	0.34	0.52	0.35	0.51	0.42	0.55	36.12	1.03
7-13	0.76	1.22	0.88	1.30	0.93	1.15	1.09	1.21	1.17	1.49	54.79	22.96
14-19	1.56	2.07	1.55	1.91	1.76	2.16	1.90	2.12	1.88	2.46	20.85	18.94
Non-disabled Adults	24.58	30.59	29.43	35.92	31.13	37.47	34.01	41.32	36.57	47.85	48.78	56.42
20-29	5.49	7.42	5.78	7.60	5.91	7.48	6.19	7.83	5.86	8.29	6.82	11.75
30-39	9.13	11.88	10.30	13.24	10.62	12.89	11.01	13.69	10.87	14.69	19.12	23.66
40-49	5.98	7.19	7.30	8.57	7.71	9.42	8.66	10.61	9.55	12.43	59.74	72.89
50-59	3.54	3.61	4.93	5.27	5.48	6.03	6.20	6.90	7.38	8.99	108.67	149.15
60-64	0.45	0.50	1.12	1.25	1.41	1.65	1.96	2.29	2.91	3.45	543.90	593.58
Aged	41.22	28.20	40.13	26.56	38.27	24.17	36.44	22.86	40.87	22.62	-0.86	-19.80
65-69	7.25	6.88	7.20	6.36	6.98	6.13	6.46	5.78	6.33	6.32	-12.67	-8.14
70-74	7.02	6.36	6.93	6.03	6.87	5.54	6.50	5.45	6.73	5.17	-4.10	-18.75
75-79	7.73	5.55	7.43	5.28	6.92	4.70	6.59	4.20	7.13	4.06	-7.77	-26.79
80-84	7.55	4.65	7.41	4.46	6.91	3.81	6.65	3.82	7.69	3.39	1.90	-27.08
85+	11.68	4.76	11.16	4.43	10.59	4.00	10.24	3.62	12.99	3.68	11.21	-22.79
Disabled Adults	31.57	37.38	27.65	33.73	27.57	34.53	26.21	31.98	19.08	25.03	-39.56	-33.04
20-29	3.15	4.08	2.60	3.55	2.59	3.59	2.45	3.16	1.73	2.18	-45.18	-46.62
30-39	6.76	8.06	5.84	7.48	5.96	7.76	5.75	7.18	4.09	5.81	-39.43	-27.86
40-49	6.91	8.05	6.08	7.14	6.52	8.25	6.63	8.43	5.08	6.83	-26.40	-15.09
50-59	8.35	10.36	7.27	9.02	7.16	8.63	6.76	7.92	5.01	6.42	-39.98	-38.01
60-64	6.41	6.84	5.86	6.53	5.34	6.31	4.62	5.28	3.17	3.79	-50.57	-44.62

a • Total number of prescription fill events

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients



Table B-6
Washington
Percentage of Drug Using Recipients Using 1 or More Screener Drugs
By Eligibility Category by Age

	1989			1990			1991			1992			1993			Percentage Change From 1989 to 1993	
	All	Demonstration	All	All	Demonstration	All	All	Demonstration	All	Demonstration	All	Demonstration	All	Demonstration	All	Demonstration	
	Pharmacies (n=1,921)	Pharmacies (n=174)	Pharmacies (n=1,921)	Pharmacies (n=174)	Pharmacies (n=1,921)	Pharmacies (n=174)	Pharmacies (n=1,921)	Pharmacies (n=174)	Pharmacies (n=1,921)	Pharmacies (n=174)	Pharmacies (n=1,921)	Pharmacies (n=174)	Pharmacies (n=1,921)	Pharmacies (n=174)	Pharmacies (n=1,921)	Pharmacies (n=174)	
Children(a)																	
0-6	6.56	5.07	6.71	4.76	7.04	5.22	7.85	5.59	8.14	6.06	24.04	19.59					
7-13	1.21	1.09	1.32	1.08	1.21	1.08	1.41	1.22	1.54	1.30	27.19	19.47					
14-19	6.04	5.22	6.50	5.39	6.94	5.78	8.02	6.43	8.52	6.95	41.20	33.18					
	24.15	18.65	24.32	16.67	25.94	18.85	28.70	19.96	29.05	21.61	20.27	15.89					
Non-disabled Adults(a)																	
20-29	44.62	32.80	46.24	34.01	46.81	34.56	49.83	36.91	50.83	38.24	13.91	16.57					
30-39	34.33	24.49	35.03	24.31	35.86	24.76	38.99	26.72	39.01	27.42	13.64	12.00					
40-49	48.93	37.45	49.95	38.52	50.32	38.30	52.37	40.54	51.98	40.54	6.23	8.26					
50-59	62.20	48.21	64.27	50.31	63.49	51.85	65.21	52.70	65.92	52.38	5.98	8.64					
60-64	72.85	57.27	75.37	60.52	75.99	60.65	77.40	61.31	77.67	61.07	6.62	6.64					
	71.38	61.11	74.93	58.97	78.36	65.32	78.54	61.83	79.31	63.29	11.10	3.56					
Aged(a)																	
65-69	75.61	62.03	75.67	61.84	76.11	62.69	76.98	62.75	76.07	62.41	0.61	0.60					
70-74	75.53	61.66	77.34	60.87	78.59	62.46	78.44	61.78	77.94	62.89	3.19	1.98					
75-79	76.00	62.43	76.07	60.84	78.03	63.20	78.66	61.04	77.53	61.80	2.01	-1.02					
80-84	76.51	62.69	76.25	63.11	76.70	62.84	78.48	64.47	77.95	62.10	1.89	-0.94					
85+	77.28	62.45	77.20	64.06	76.66	63.05	77.92	65.71	76.67	62.78	-0.78	0.54					
	73.92	61.02	73.19	61.24	72.75	61.84	73.55	62.16	72.46	62.47	-1.97	2.39					
Disabled Adults(a)																	
20-29	72.79	57.15	74.16	58.74	74.73	59.57	75.99	60.00	75.38	60.11	3.56	5.18					
30-39	58.99	45.48	59.14	46.92	60.17	48.40	62.58	48.85	62.90	49.83	6.64	9.56					
40-49	69.39	55.07	71.56	57.22	72.48	58.72	74.12	58.33	72.53	58.84	4.52	6.86					
50-59	75.05	59.00	76.77	61.20	78.41	61.74	78.61	62.09	77.40	62.00	3.13	5.08					
60-64	79.59	63.67	80.78	64.30	80.14	63.72	81.20	65.08	80.65	63.86	1.33	0.31					
	79.54	63.72	80.01	63.90	80.04	65.19	81.14	66.21	81.67	65.90	2.68	3.41					

a • Weighted average over all sub-groups

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients

Table B-7
Washington
Screener Drug Expenditures per Screener Drug Recipient
By Eligibility Category by Age

	1989			1990			1991			1992			1993			Percentage Change From 1989 to 1993
	All Pharmacies (n=1,921)		Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)		Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)		Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)		Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)		Demonstration Pharmacies (n=174)	
	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies	Pharmacies
Children(a)	36.06	36.30	42.75	43.52	44.87	41.93	45.31	40.38	48.65	45.72	34.90	25.95				
0-6	47.03	43.75	50.73	47.93	55.33	48.67	53.90	41.76	53.06	44.65	12.82	2.06				
7-13	36.39	40.80	42.40	48.05	45.31	39.94	46.94	41.45	53.97	50.84	48.31	24.60				
14-19	34.21	32.96	41.51	40.47	43.12	41.44	43.22	39.61	45.50	43.58	32.99	32.23				
Non-disabled Adults(a)	108.55	80.01	147.75	107.73	166.38	127.72	185.28	146.31	203.70	162.82	87.66	103.51				
20-29	50.44	39.39	61.82	51.90	66.70	57.48	70.73	63.89	74.53	67.97	47.75	72.54				
30-39	102.30	76.08	134.99	99.41	148.14	114.64	158.29	123.97	167.39	133.31	63.62	75.22				
40-49	174.93	132.73	232.62	166.46	268.10	198.74	297.31	228.66	301.13	232.15	72.14	74.90				
50-59	269.17	199.49	350.63	238.67	408.56	294.37	451.25	332.55	457.95	348.24	70.13	74.57				
60-64	241.05	217.97	360.19	263.96	419.17	309.78	474.32	380.91	484.60	389.39	101.03	78.64				
Aged(a)	264.70	221.63	313.86	258.59	351.64	288.08	385.69	312.25	402.59	331.63	52.09	49.63				
65-69	308.88	227.86	365.63	259.00	396.05	295.83	428.93	317.61	445.72	352.11	44.30	54.53				
70-74	286.31	236.84	340.08	285.24	382.52	292.12	419.10	329.76	430.66	328.05	50.42	38.51				
75-79	276.24	220.89	327.80	253.86	363.63	295.23	402.71	304.76	415.16	325.97	50.29	47.58				
80-84	263.29	234.44	310.24	274.08	344.66	295.11	381.87	316.00	403.70	334.40	53.33	42.64				
85+	218.43	184.51	258.80	217.81	298.70	255.95	325.52	281.97	344.44	303.73	57.69	64.62				
Disabled Adults(a)	297.20	205.35	342.38	237.82	357.90	250.58	376.52	262.29	372.79	265.33	25.43	29.21				
20-29	190.42	124.56	217.96	148.58	225.09	163.45	233.84	160.20	229.20	149.72	20.37	20.20				
30-39	274.35	178.47	307.58	210.79	312.48	198.25	323.85	212.28	318.97	213.70	16.26	19.74				
40-49	309.99	207.88	352.64	233.35	365.47	254.21	391.40	276.60	400.94	279.37	29.34	34.39				
50-59	337.42	255.24	393.46	290.24	417.50	302.19	440.30	310.25	431.65	327.30	27.92	28.23				
60-64	336.06	243.59	391.55	287.11	425.76	342.34	452.54	354.41	434.34	350.70	29.24	43.97				

a • Weighted average over all sub-groups

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients

Table B-8
Washington
Number of Screener Drug Prescriptions per Screener Drug Recipient
By Eligibility Category by Age

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)
Children(a)	2.31	2.15	2.72	2.63	2.54	2.27	2.38	2.06	2.49	2.17	7.92	0.75
0-6	2.70	2.45	3.22	2.97	3.01	2.52	2.46	2.09	2.85	2.10	5.74	-14.39
7-13	2.65	2.69	3.29	3.33	2.94	2.58	2.87	2.40	3.04	2.60	14.89	-3.29
14-19	2.12	1.87	2.39	2.23	2.31	2.08	2.16	1.90	2.19	1.98	3.17	5.92
Non-disabled Adults(a)	4.59	3.37	5.75	4.22	5.66	4.28	5.58	4.34	6.01	4.64	31.03	37.85
20-29	2.74	2.14	3.14	2.52	2.97	2.44	2.85	2.40	2.93	2.55	7.26	19.07
30-39	4.54	3.39	5.51	4.09	5.28	3.95	5.07	3.90	5.20	4.05	14.53	19.51
40-49	6.63	4.89	8.24	5.90	8.27	6.12	8.20	6.23	8.34	6.18	25.90	26.59
50-59	9.16	6.44	11.57	7.94	11.96	8.62	11.54	8.49	11.68	8.61	27.51	33.55
60-64	8.19	6.69	11.69	8.44	12.30	9.22	12.21	9.62	13.18	9.42	60.81	40.90
Aged(a)	10.95	7.82	12.83	8.95	12.35	8.58	12.06	8.26	15.64	8.46	42.81	8.18
65-69	10.83	7.56	12.76	8.45	12.05	8.43	11.32	7.84	12.50	8.37	15.41	10.62
70-74	10.79	8.11	12.61	9.49	12.21	8.44	11.69	8.50	13.73	8.20	27.23	1.12
75-79	11.21	7.85	13.25	9.03	12.55	8.82	12.40	8.10	15.80	8.42	40.97	7.14
80-84	11.42	8.40	13.32	9.63	12.87	8.85	12.57	8.59	17.19	8.71	50.46	3.66
85+	10.67	7.32	12.44	8.34	12.20	8.49	12.26	8.46	18.08	8.87	69.48	21.14
Disabled Adults(a)	10.98	7.50	12.39	8.35	11.31	7.76	10.57	7.26	10.53	7.08	-4.10	-5.58
20-29	8.01	5.41	9.04	6.27	8.28	5.91	7.80	5.26	7.72	4.78	-3.68	-11.52
30-39	10.44	6.81	11.54	7.46	10.54	6.70	9.74	6.35	9.56	6.25	-8.44	-8.25
40-49	11.65	7.67	12.90	8.16	11.56	7.77	11.09	7.70	11.29	7.57	-3.06	-1.32
50-59	12.05	8.86	13.65	9.88	12.44	8.82	11.56	8.14	11.40	8.08	-5.43	-8.89
60-64	11.67	8.23	13.53	9.55	12.68	9.77	11.76	8.76	11.72	8.37	0.44	1.60

a • Weighted average over all sub-groups

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients

Table B-9
Washington
Screener Drug Expenditures(a) by Drug Class

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)
All Screener Drugs												
Core(b)	20,806	2,703	27,103	3,780	34,143	5,341	41,262	7,038	44,190	7,969	112.39	194.82
Peripheral(c)	11,172	1,442	13,548	1,834	17,036	2,569	21,094	3,499	23,096	4,122	106.73	185.83
ACE Inhibitors												
Core(b)	1,495	207	2,042	274	2,613	382	3,322	527	3,762	652	151.67	215.52
Peripheral(c)	2,502	302	3,085	390	3,532	510	4,052	623	4,312	701	72.33	132.41
Antidepressants												
Core(b)	2,623	347	4,208	602	5,522	895	6,947	1,245	7,617	1,440	190.40	315.27
Peripheral(c)	1,331	178	1,466	212	1,647	262	1,869	317	1,983	362	48.99	103.15
Antipsychotics												
Core(b)	2,778	317	2,998	396	3,313	531	3,652	629	3,723	683	34.02	115.35
Peripheral(c)	1,289	134	1,436	155	1,666	188	1,916	228	2,029	250	57.41	86.12
Benzodiazepines												
Core(b)	544	81	595	93	679	105	783	134	805	142	48.07	75.59
Peripheral(c)	2,439	319	3,150	428	4,138	629	5,179	855	5,535	959	126.92	200.43
Calcium Channel Blockers												
Core(b)	2,296	306	3,343	470	4,476	696	5,621	951	6,323	1,162	175.40	279.23
Peripheral(c)	1,943	291	2,354	376	2,893	505	3,493	716	3,807	839	95.94	187.89
Digoxin												
Core(b)	345	32	409	37	452	44	478	53	487	56	40.98	75.84
Peripheral(c)	96	9	123	14	154	22	191	38	195	41	103.23	349.99
H2 Receptor Antagonists												
Core(b)	6,245	784	8,085	1,085	10,389	1,563	12,789	2,127	14,231	2,491	127.89	217.92
Peripheral(c)	2,722	343	3,250	438	4,495	672	5,971	966	6,965	1,188	155.82	246.44
NSAIDs												
Core(b)	4,481	630	5,422	823	6,699	1,124	7,670	1,373	7,243	1,343	61.64	113.26
Peripheral(c)	2,124	272	2,785	375	3,470	532	4,023	679	4,342	775	104.39	185.32

a • In thousands

b • Core screener drugs include those drugs which are members of the eight therapeutic categories considered by the screening criteria

c • Peripheral screener drugs include those drugs which affect the appropriateness of core drug use

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files. Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients.

Table B-10
Washington
Screener Drug Prescription Volume(a) by Drug Class

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)
All Screener Drugs												
Core(b)	841,001	103,432	1,064,635	139,582	1,164,792	171,472	1,253,180	201,779	1,455,772	221,579	73.10	114.23
Peripheral(c)	905,834	110,557	1,037,393	132,032	1,128,017	163,318	1,219,892	190,389	1,347,030	208,976	48.71	89.02
ACE Inhibitors												
Core(b)	46,126	6,019	65,518	8,318	72,943	10,048	87,078	13,362	111,961	16,268	142.73	170.28
Peripheral(c)	247,732	29,559	299,925	37,189	317,614	46,703	333,090	51,060	389,550	56,490	57.25	91.11
Antidepressants												
Core(b)	162,708	19,937	217,737	28,633	232,767	35,304	266,764	45,149	315,843	51,179	94.12	156.70
Peripheral(c)	133,299	17,345	156,686	21,970	155,717	24,679	163,905	27,678	191,118	31,429	43.38	81.20
Antipsychotics												
Core(b)	147,732	15,643	164,909	19,707	163,978	23,833	165,129	25,756	187,281	26,694	26.77	70.65
Peripheral(c)	100,701	11,859	117,689	14,916	116,768	16,508	121,543	17,757	147,824	19,904	46.79	67.84
Benzodiazepines												
Core(b)	57,365	7,118	72,834	9,443	75,876	10,621	83,998	12,970	99,384	13,679	73.25	92.17
Peripheral(c)	318,024	40,329	381,356	49,558	425,215	62,841	478,377	77,370	517,607	84,434	62.76	109.36
Calcium Channel Blockers												
Core(b)	65,151	8,424	108,471	15,068	117,913	17,109	126,891	20,530	157,218	24,391	141.31	189.54
Peripheral(c)	112,405	13,379	130,754	15,897	141,360	18,662	150,938	21,980	180,375	23,789	60.47	77.81
Digoxin												
Core(b)	44,876	4,106	51,907	4,572	55,163	5,033	58,175	5,985	79,214	6,531	76.52	59.06
Peripheral(c)	4,763	502	5,772	687	5,356	712	5,407	882	5,992	892	25.80	77.69
H2 Receptor Antagonists												
Core(b)	120,327	14,985	158,124	20,919	200,904	29,827	192,555	30,973	225,382	34,760	87.31	131.97
Peripheral(c)	149,510	18,605	187,599	24,107	192,783	27,003	196,431	29,886	229,886	31,888	53.76	71.39
NSAIDs												
Core(b)	196,716	27,200	225,135	32,922	245,248	39,697	272,590	47,054	279,489	48,077	42.08	76.75
Peripheral(c)	147,794	17,653	173,543	21,836	206,192	30,849	193,771	30,711	226,201	33,912	53.05	92.10

a • Total number of prescription fill events

b • Core screener drugs include those drugs which are members of the eight therapeutic categories considered by the screening criteria

c • Peripheral screener drugs include those drugs which affect the appropriateness of core drug use

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients.

Table B-11
Washington
Percentage of Screener Drug Expenditures
By Drug Class(a)

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)		
ACE Inhibitors	7.18	7.65	7.53	7.25	7.65	7.15	8.05	7.49	8.51	8.19	18.49	7.02
Antidepressants	12.61	12.83	15.53	15.92	16.17	16.77	16.84	17.68	17.24	18.07	36.73	40.86
Antipsychotics	13.35	11.74	11.06	10.47	9.70	9.94	8.85	8.93	8.42	8.57	-36.90	-26.95
Benzodiazepines	2.61	2.99	2.20	2.45	1.99	1.97	1.90	1.91	1.82	1.78	-30.28	-40.45
Calcium Channel Blockers	11.03	11.33	12.34	12.44	13.11	13.04	13.62	13.51	14.31	14.58	29.67	28.63
Digoxin	1.66	1.19	1.51	0.99	1.32	0.82	1.16	0.75	1.10	0.71	-33.62	-40.36
H2 Receptor Antagonists	30.01	28.98	29.83	28.71	30.43	29.26	31.00	30.22	32.20	31.26	7.30	7.84
NSAIDs	21.54	23.30	20.00	21.76	19.62	21.04	18.59	19.51	16.39	16.85	-23.90	-27.66

a • Core screener drugs only

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients.

Table B-12
Washington
Percentage of Screener Drug Prescription Volume(a)
By Drug Class(b)

	1989		1990		1991		1992		1993		Percentage Change From 1989 to 1993	
	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)	All Pharmacies (n=1,921)	Demonstration Pharmacies (n=174)
ACE Inhibitors	5.48	5.82	6.15	5.96	6.26	5.86	6.95	6.62	7.69	7.34	40.22	26.16
Antidepressants	19.35	19.28	20.45	20.51	19.98	20.59	21.29	22.38	21.70	23.10	12.14	19.83
Antipsychotics	17.57	15.12	15.49	14.12	14.08	13.90	13.18	12.76	12.86	12.05	-26.76	-20.34
Benzodiazepines	6.82	6.88	6.84	6.77	6.51	6.19	6.70	6.43	6.83	6.17	0.09	-10.29
Calcium Channel Blockers	7.75	8.14	10.19	10.80	10.12	9.98	10.13	10.17	10.80	11.01	39.41	35.16
Digoxin	5.34	3.97	4.88	3.28	4.74	2.94	4.64	2.97	5.44	2.95	1.97	-25.75
H2 Receptor Antagonists	14.31	14.49	14.85	14.99	17.25	17.39	15.37	15.35	15.48	15.69	8.21	8.28
NSAIDs	23.39	26.30	21.15	23.59	21.06	23.15	21.75	23.32	19.20	21.70	-17.92	-17.49

a • Total number of prescription fill events

b • Core screener drugs only

Source: Washington Medicaid Claims, Washington Medicaid Eligibility Files; Includes out-of-state pharmacies filling prescriptions for Washington Medicaid recipients.

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